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for Teachers *of*
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HIGH SCHOOL
and COLLEGE
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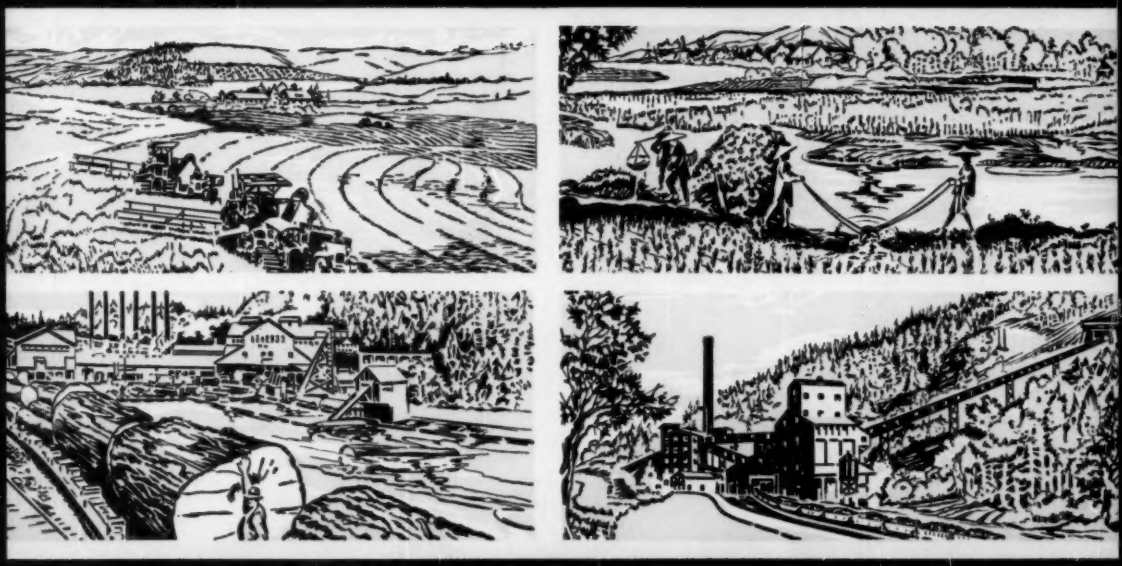

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Mr. Hladik received his Master of Arts degree from the Department of Geography, the University of Chicago, in March, 1961. This article is a part of a Master's thesis written under the supervision of Professor Gilbert F. White. Mr. Hladik is a high school geography teacher in the William J. Bogan High School. In the April, 1960 issue of *The Journal of Geography* appeared a short article entitled, "Teachers of High School Geography Needed: Can You Qualify?" which gives information about geography in transition in the public high schools of Chicago.

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Mr. Martin has a B.Sc., London School of Economics and Political Science, a P.G.C.E., Kings College, London University and a M.A., University of Florida. He is an Assistant Professor in the Department of Geography, Eastern Michigan University, Ypsilanti.

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Dr. Cramer is Professor of Geography, East Carolina College, Greenville, North Carolina. Since 1955 he has lectured frequently over both closed-circuit and commercial television stations. He is a member of the NCGE Television Committee.

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Mr. Lokke attended the United States Navy Weather School at Lakehurst, New Jersey during 1946-1947. He has a B.S. from Wheaton College and a M.S. from Texas Technological College. At present he is employed by the Pan American Petroleum Corporation.

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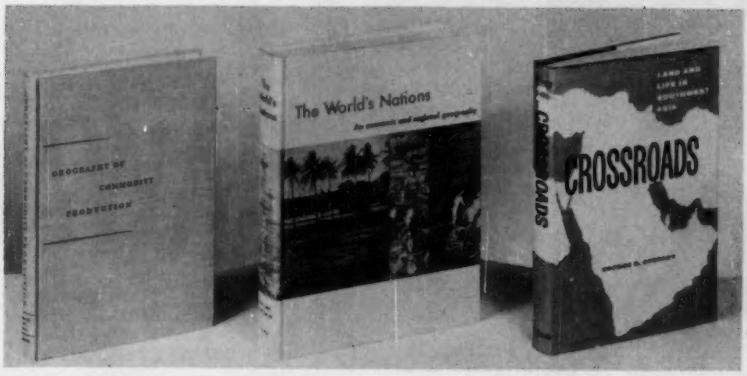

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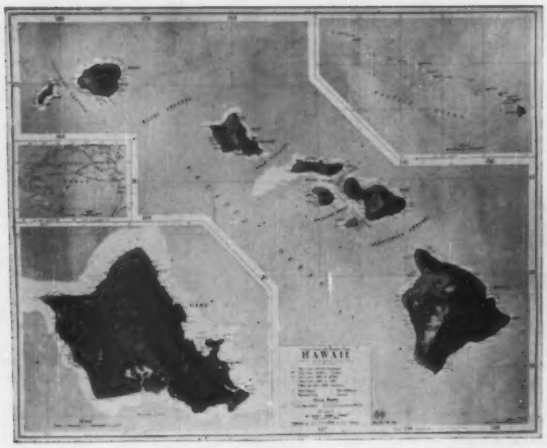

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GEOGRAPHY IN TRANSITION IN THE PUBLIC HIGH SCHOOLS OF CHICAGO—1959

RALPH A. HLADIK

Introduction

In 1959 geography in the public high schools of Chicago was in transition. In recognition of the need to develop in the student an understanding of how man lives and works in the diverse regions of the world and an appreciation of the ties that bind mankind together, administrators and educators in many sections of the country were readjusting their teacher training and curricular programs. The Chicago Board of Education was in the forefront of this trend. As a result of the recommendations incorporated within a *Tentative Report on Secondary Education in the Chicago Public Schools,* new regulations for graduation from the secondary school were adopted and became effective as of February 3, 1958.[1] Included in these regulations was the requirement that students in high school take one year of modern world geography or one year of modern world history. In the past only civics and United States history had been required. The new requirements for graduation applied only to students entering high school on February 3, 1958 and thereafter, thus making the period 1958-59 a transition period.

This study of geography in the public high schools of Chicago during that period has been made with two purposes in mind: first, to determine what problems were encountered in carrying out the transition program; and, second, to present a picture of the status of geography in the public high schools of the city as the initial period drew to a close.

Assembling pertinent data on the transition required visits to the Bureau of Curriculum Development, the Division of Administrative Research, the Board of Examiners, and the Bureau of Teacher Personnel of the Chicago Board of Education. It also required observation of teaching situations in selected schools.

In Chicago, geography is taught in thirty-three public high schools.[2] In order to arrive at a valid sample, I visited the ten high schools with the highest percentage of students enrolled in geography, and another six high schools which I selected from the remaining group. This enabled me to study sixteen high schools which offered the more diverse geography programs. These schools accounted for 70.7 per cent of the total geography enrollment. In these schools I interviewed the teachers of geography in order to obtain information as to course content, learning experiences, teaching methods, interests and

[1] Chicago Board of Education, *Tentative Report on Secondary Education in the Chicago Public Schools,* Chicago, 1957, pp. 1-48.

[2] Chicago Board of Education, Division of Administrative Research, *Summary Sheet of the Detailed Listing for High School Teacher Program (Organization of School Report),* Chicago, September, 1959.

abilities of the students, systems of programming, types of evaluation, educational qualifications of the teachers, textbooks and equipment, and suggestions for improving the course. In consulting with principals and teachers from schools other than those visited, I found their geography programs to be consistent with the geography programs of the schools in which I observed classes. The findings from the school visits are believed to be representative of conditions throughout the high school system.

Chicago's New Geography Program

On February 3, 1958, geography in the public high schools of Chicago began a transition from an elective course in the Commercial Department to one of the required courses in the Social Studies Department. In order to understand some of the problems encountered in carrying out the transition program it is necessary to trace the development of geography since it was first incorporated into the Commercial Department.

During the early 1930's a general course called Physiography which was composed of subject matter from astronomy, meteorology, geology, ecology, biology, physical geography, chemistry, and physics was being taught by the Geography Department. A book used at that time was *The Elements of Geography*, which treated physiographic processes and features briefly, and developed at greater length the relations of earth, air, and water to life, and especially to human affairs.[3]

As a result of increasing emphasis on the natural environment in the early 1930's, general science began to gain in prominence and was added to the curriculum. In order to accommodate the addition, strict physiography became part of the Science Department. During the next few years the attention paid to physiography in the general science course appears to have declined rapidly.

A book entitled *Industrial Geography*, containing subject matter often included under the term Commercial Geography, was one of the principal books used in the new Commercial Geography course.[4] This book involved all of the major forms of industry, including agriculture, mining, manufacturing, trading, and transportation. The aim of the book was to stress causes, principles, trends, and those facts which have significance in the industrial life of a country or region. The procedure in the book was to make both commodities and countries the units of treatment.

During the late 1930's there began a marked and persistent decrease in the percentage of students enrolled in Commercial Geography (see Table 1). A low was reached in 1951 when only 4.9 per cent of the total membership in the high schools were enrolled in geography. This decrease resulted from a number of factors taking shape after the change in curriculum. Some effective teachers moved into the Science Department in preference to Commercial Geography. The new course apparently had less appeal to students of the time. Those who did take the course included a large proportion of incompetent and slow students. The course had a reputation for low quality work. Whatever the precise combination of reasons, by the mid 1950's the name of Commercial Geography was in low repute in the school system much to the distress of some devoted teachers.

In 1957 *A Curriculum Guide for Economic Geography* was published, providing a systematic approach to the develop-

[3] Rollin D. Salisbury, Harlan H. Barrows, and Walter S. Tower, *The Elements of Geography*, Henry Holt and Company, New York, 1913, pp. v-vi.

[4] Ray Hughes Whitbeck, *Industrial Geography*, American Book Company, New York, 1924, pp. v-vi.

TABLE 1

GEOGRAPHY STUDENTS IN THE PUBLIC HIGH SCHOOLS OF CHICAGO, SEPTEMBER 1936 THROUGH SEPTEMBER 1959

Year	Membership[5]	Geography Students[6]	Percentage of Total Membership Enrolled in Geography
1936.....	130,993	15,593	11.9
1937.....	129,242	13,209	10.2
1938.....	137,669	12,755	9.3
1939.....	141,239	12,596	8.9
1940.....	139,654	11,040	7.9
1941.....	129,269	10,176	7.9
1942.....	121,368	8,574	7.1
1943.....	111,385	7,149	6.4
1944.....	109,249	7,270	6.7
1945.....	105,942	7,037	6.6
1946.....	100,583	7,107	7.1
1947.....	93,036	6,009	6.5
1948.....	86,626	6,078	7.0
1949.....	84,059	5,341	6.4
1950.....	83,098	4,180	5.0
1951.....	81,733	3,983	4.9
1952.....	80,857	4,093	5.1
1953.....	78,292	4,231	5.4
1954.....	78,567	4,488	5.7
1955.....	79,027	4,624	5.9
1956.....	80,974	4,715	5.8
1957.....	85,570	4,868	5.7
1958.....	90,108	5,195	5.8
1959.....	89,492	6,273	7.0

ment of geographic and economic understanding, and bringing into focus this approach in analyzing and interpreting the day's events and in understanding the people of the United States and those of other nations.[7] The Guide had been prepared by an Economic Geography committee consisting of eleven people and appointed by the General Superintendent of Schools. Geography was seen by that group as an important part of the general education of all high school students. The national and world affairs in which students are interested and about which they should be intelligent take place in a geographic setting. It is important, therefore, that young people have an understanding of the geographic factors which condition the ways in which people live and work in the United States and in other parts of the world. Economic Geography as seen by the committee considers man's use of his geographic resources, both physical and man-made, together with his cultural heritage and his present level of development in making a living. Because resources and culture vary in combination from place to place, man produces many different commodities which are distributed through the complex network of domestic and international trade. The production, consumption, and distribution of these major world commodities and the problems involved were the concern of the new course.

In the first semester the following four units were to be taught:

Unit I—People on the Earth—Specific aims are to understand: (1) the role of environment in the distribution of occupations and people; (2) the population trends in Chicago, in the United States of America, and throughout the world; (3) the reasons leading to the migrations of people.

Unit II—Meeting Food Needs—Specific aims are to understand: (1) the role of latitude, climate, landforms, soil, and drainage in the production of food; (2) the dependence of a people's food supply on: eating habits, farming techniques, tools, science, technology, distribution, and government; (3) the interdependence of the United States and other countries for their food supply.

Unit III—Making the Things People Need—Specific aims are to understand: (1) the major factors which influence the location of manufacturing activities; (2) the dependence of manufacturing on science, technology, and government; (3) the need for making the wise and efficient use of natural resources; (4) the effect of industrialization on human interdependence.

Unit IV—Living in Great Cities—Specific aims are to understand: (1) the specific functions and purposes of great cities; (2) the physical and cultural factors involved in the location and growth of cities; (3) the general land-use pattern of great cities.

In the second semester the following

[5] Chicago Board of Education, *High Schools Principal's Monthly Report of Enrollment, Membership and Attendance,* September, 1936 through September, 1959.

[6] *Organization of School Report, op. cit.,* September, 1936 through September, 1959.

[7] Board of Education, *Curriculum Guide for Economic Geography,* Chicago, 1957, pp. 1-64.

five units were to be taught:

Unit

I Western Europe
  Part 1—Western Europe as a Whole
  Part 2—Selected Countries for Detailed Study
    A. Britain
    B. Germany
    C. France
II Eastern and Southern Asia
  Part 1—Eastern and Southern Asia as a Whole
  Part 2—Selected Countries for Detailed Study
    A. China
    B. Japan
    C. India
III The Soviet Union and the Middle East
  Part 1—The Soviet Union
  Part 2—The Middle East as a Whole
IV Southern Lands
  Part 1—Latin America
  Part 2—Africa
  Part 3—Australia
V The United States in the World Today

In 1957 some of the high schools with extensive geography programs immediately gave indication of adopting the objectives set forth in the new curriculum guide by renaming their courses "Economic Geography."

In 1958 when the new requirements for graduation from the high school were adopted, a new course of study was designed placing geography in the ninth grade with flexibility in programming so that it could be offered in grades nine to eleven.[8] The new course of study was prepared by the Curriculum Council Committee on High School Social Studies with special credit for developing it (in keeping with the policy decisions of the committee) given to the subcommittee on World Geography consisting of four teachers.

In the view of that group, since modern means of transportation and communication have made neighbors of the peoples of the world, it is essential that students gain an understanding of these peoples and their values. The study of geography reveals the interdependence of peoples and interrelationship of man and his environment and prepares students to understand the shrinking world in which they live.

The new course of study was designed to meet the requirement for graduation recommended by the Committee on Secondary Education of one year of World Geography or one year of Modern World History, and the recommendation of the Curriculum Council Committee on Social Studies that World Geography be placed in the ninth grade. This course of study was distributed to all secondary schools. Under it, geography, which was now included in the Social Studies program was to be taught as a general rather than a specialized course, making it a basis for unifying and correlating into one organized system the fields of the natural and social sciences.

The primary objective under the tentative program in World Geography was to develop in students an understanding of how man lives and works in the diverse regions of the world, and an appreciation of the ties that bind mankind together. In order to achieve this objective the program proposed to teach the following understandings, attitudes, appreciations, and skills:

I. Understandings and Knowledge
  A. A knowledge of the location and character of the land and water features of the earth in their various relationships to man's activities.
  B. An understanding of the economic interdependence of all peoples and all regions.
  C. An understanding of the conditions and problems which develop from man's utilization of his environment.
  D. An understanding of the need for conservation of natural and human resources and man's personal responsibilities regarding conservation.
  E. The understanding necessary to interpret and evaluate contemporary events from a geographic point of view.
  F. An understanding of how revolutionary changes in energy production and other

[8] Chicago Board of Education, *A Tentative Program in World Geography for the Secondary Schools*, Chicago, 1958, pp. 1-56.

technological advances are changing the living conditions and world relationships of people.

II. Attitudes and Appreciations
- A. To develop an intellectual curiosity and open-mindedness toward ways of living that differ from one's own.
- B. To appreciate the achievements of peoples when viewed against limiting factors of their environments.
- C. To attain a sympathetic understanding of peoples in their handling of current problems: providing sufficient food for a dense population; developing stable governments; increasing industrial production; developing skills and techniques of the people through education.
- D. To appreciate the artistic expressions of other people: their music, ballets, paintings, and literature and to realize that the fine arts of a nation reflect the life of its people.
- E. To appreciate that a geographically informed citizenry and a sound diplomacy are necessary for intelligent participation in world affairs.
- F. To stimulate a desire and provide a background for fuller satisfaction and enjoyment in travel.
- G. To appreciate the need to co-operate with others in securing legislation effecting desirable changes in environment and in the production, distribution, and consumption of essential commodities.
- H. To appreciate the contributions of workers, investors, and management to the well-being of people all over the world.

III. Skills
- A. To increase skill in securing geographic information from landscapes, maps, globes, statistics, graphs, pictures, and printed materials.
- B. To acquire facility in recording geographic information on maps, charts, and graphs.
- C. To progress in the ability to use reference materials: atlases, almanacs, dictionaries, gazetteers, yearbooks, encyclopedias, government publications, and other sources.
- D. To increase the skills in the use of tools of communication: reading, writing, speaking, listening, and observing.
- E. To gain in self-direction and independence in solving problems related to the field of world geography.

Although the understandings, attitudes, appreciations, and skills set forth in the new course of study were much the same as in the former course of study, the suggested learning experiences which might be employed by the teacher in his effort to meet the needs of each pupil were based upon world geography and were organized in terms of people, countries, and world regions about which the student learns in newspapers, radio, television, and movies.

In the first semester the following two units were to be taught:

Unit

I What Are the Patterns of World Geography?
- A. Definition of geography
- B. Where the people live
  - 1. Areas of density
  - 2. Areas of moderate population
  - 3. Areas of sparse population
- C. Why people live where they do
  - 1. Climate
  - 2. Topography
  - 3. Natural resources
- D. How people live where they do
  - 1. Occupations
  - 2. Attempts to control the natural environment
- E. How people exchange goods and ideas
  - 1. Transportation—lanes and modes
  - 2. Communication—methods and limitations
- F. Tools which help us to develop an understanding of world geography
  - 1. Globes
  - 2. Maps
    - a. Projections
    - b. Symbols
    - c. Legends
    - d. Scales
  - 3. Charts
  - 4. Graphs
  - 5. Interpreting landscapes
  - 6. Reading pictures geographically
  - 7. Audio-Visual aids
  - 8. Printed materials
  - 9. Geographic vocabulary

II How Do We in the United States Use Our Natural Environment and Human Resources to Maintain Our Position as a Leader in the World?
- A. The New England States—How has the shortage of natural resources affected the utilization of this region?
- B. The Middle Atlantic States—How has the combination of location and natural resources been utilized to create a region of great commercial and industrial importance?
- C. The Middle West—How does the wealth of resources in this strategically located area contribute to its vast agricultural prosperity, heavy industrial production, and concentration of commerce?
- D. The South—How have revolutionary

changes in energy production and other technological advances resulted in the emergence of man's utilization of resources?

E. The West—How has the vast expanse known as the West become a region of contrast in land use and human occupance because of the variance of nature's gifts and man's discovery of ways to use these gifts?

F. Alaska and United States Lands Outside the States—How have these lands been a stepping stone to the rest of the world and made us more aware of the interdependence of all peoples in all regions?

G. Conservation of resources—How will conservation of resources make it possible for the United States to support a growing population and retain its position of leadership among world powers?

H. Interrelationships of regions.

I. Relationships of the United States to the to the world.

In the second semester the following two units were to be taught:

Unit

III How Do Our Neighbors in the Western Hemisphere Live and Work with Their Resources and Trade with Us?

A. Canada—How have twentieth century innovations changed the potential future of our good neighbor to the north?

B. Mexico—How does our good neighbor to the south utilize its natural resources to develop industries, extend trade, and improve its way of life?

C. Central American and Caribbean Lands —How do these strategically located lands supply middle latitude countries with tropical produce and markets?

D. South America—How have the rapidly changing South American nations used their great variations in topography, climatic conditions, and resources to enter the world commodity trade?

E. Reconnaissance of Western Hemisphere in World Affairs—How does our study of the western hemisphere make us cognizant of the similarities and differences among the physical, natural, and cultural resources and of man's interdependence?

IV How Do the Peoples in Other Parts of the World Utilize Their Resources and Enter the World Market with Us?

A. Europe—How has this densely populated continent of great and small powers used its location and varied resources to develop its agriculture, manufacturing, and trade?

B. U.S.S.R.—How has this Nation, which extends into two continents, utilized its location and resources to become a major agrarian and industrial power in a competitive world?

C. Middle East—How has the strategic location of this area of limited surface resources with great subsurface wealth become a major concern to the present-day world?

D. Eastern and Southern Asia—How have these densely populated regions, lands of extreme contrast, provided for their peoples and been able to produce for the world distinctive products and raw materials?

E. South Pacific—How have these distant lands utilized their location and resources to provide commercial ties with the rest of the world?

F. Africa—How is this relatively little known colonial continent awakening to a realization of the importance of its vast store of resources and becoming increasingly significant to the family of nations?

G. Our last frontier, the Polar regions—How has the shrinking of the geographic world with its revolutionary and technological changes inspired man to seek to uncover the resources of these relatively unknown areas?

According to the latest available figures, "World Geography," as the course was now known, was being taught in 33 of 42, or 78.6 per cent of the general high schools in the city in 1959. Table 2 shows 33 of the general high schools listed according to the prominence of their geography programs. Although the name of the course does not presently explain its content, the name does indicate whether or not the school had yet made an attempt to readjust to the new graduation requirements by changing the label of its offering. It is possible that in a few instances the course content changed while the name remained unchanged but this was not observed.

In September, 1959, the 6,273 students enrolled in 201 geography classes marked an increase of 1,078 students and 44 classes since the preceding September.

There was a wide variation in the percentage of students enrolled in geography, ranging from 20.1 per cent in school 1 to 1.7 per cent in school 33. This variation was due to a combination of

TABLE 2

PERCENTAGE OF STUDENTS ENROLLED IN GEOGRAPHY IN 33 SCHOOLS, SEPTEMBER 1959[9]

Number of School and Name of Course	Percentage of Students Enrolled in Geography in Each School	Geography Students	Geography Classes
1. World Geography	20.1	133	4
2. World Geography	18.6	305	9
3. World Geography	18.4	248	7
4. World Geography	17.6	442	14
5. World Geography	14.7	411	13
6. World Geography	14.4	301	10
7. World Geography	14.2	427	14
8. World Geography	12.1	206	7
9. Commercial Geography	11.5	434	16
10. World Geography	10.4	283	9
11. World Geography	10.3	117	4
12. Commercial Geography	10.0	227	6
13. Commercial Geography	9.9	161	5
14. World Geography	9.7	141	4
15. Commercial Geography	9.6	208	7
16. World Geography	9.2	247	7
17. Commercial Geography	9.1	183	6
18. World Geography	9.0	63	2
19. Commercial Geography	8.9	163	6
20. Commercial Geography	8.5	215	6
21. World Geography	7.0	268	9
22. Economic Geography	6.5	147	5
23. Commercial Geography	5.8	127	4
24. World Geography	5.6	110	3
25. World Geography	5.0	140	5
26. World Geography	5.0	121	4
27. Commercial Geography	4.4	128	4
28. World Geography	3.6	79	3
29. World Geography	2.9	72	2
30. Economic Geography	2.2	68	2
31. World Geography	2.1	24	1
32. Commercial Geography	1.9	21	1
33. World Geography	1.7	53	2
Total	7.0	6,273	201

[9] *Organization of School Report, op. cit.*, September, 1959.

reasons. The number of classes taught in each school depends upon the number of teachers qualified or ready to teach World Geography, and, as indicated later, this was uneven. The number of students enrolled in the school (662 to 3,777 students) will determine how many classes are programmed. The length of time the school has been open (1 month to 72 years) appears to affect the number of classes being taught since the newer schools have initiated world geography on opening day. It was reported in some schools with a high percentage of students going on to college that there was no demand for geography since it could not be accepted as social studies credit for college admission. No detailed assessment of the above factors has been made, but they have been listed in order of importance in the schools in which they were observed.

Many college preparatory students find their social studies in high school governed by college entrance requirements. They select courses they believe

will meet the entrance standards. It is thought in some schools, probably as a carry-over from the old Commercial course, that geography does not qualify. Contrary to this belief, geography is accepted as social studies credit for admission to the following colleges and universities in the Chicago area: Chicago City Junior College, Chicago Teachers College, DePaul University, Illinois Wesleyan University, Lake Forest College, Loyola University Northwestern University, Purdue University, Roosevelt University, Saint Xavier College, the University of Chicago, Valparaiso University, and Wheaton College. The University of Illinois will also accept geography as social studies credit if it is in combination with two history credits.

In all of the geography classes visited during the transition period it was found that the students were from all four grades of high school, ranging in age from thirteen through eighteen, and representing varied levels of intelligence. In no instance was the class restricted to a single age group. The "Tentative Program" had contemplated emphasis on the ninth grade. In order to meet the wide variation in interest and ability found among these students, the learning experiences and materials recommended in the new course of study were diversified. For example, provision was made for the academically-able student to pursue separate interrelated projects such as the reading of regional novels or the study of the historical development of a country. The spread in student age was, however, even greater than anticipated.

Observations also indicated wide variations in learning experiences from school to school, and class to class. In some classes much time was spent on teacher-question, student-answer recitation relating to the day's lesson and reviewing previous lessons. In other classes the daily activity was centered around the correction and discussion of homework and other written assignments. In some classes, but less frequently, panel discussions, committee work, informl discussion, and other similar activities were observed. In no instances were field trips planned due to the difficulty involved in rescheduling classes, but motion pictures were being used occasionally. In each case, where a motion picture was being shown, adequate preparation before and activities following the showing of the film were intended to clarify the concepts presented in the film. In one class, the students were working crossword puzzles which had been designed by the teacher for the purpose of developing their geographic vocabulary. In another class, the teacher was explaining the function of a smudgepot used in fruit-growing areas. And, in still another class, current events was the topic. The above variations resulted in part, from the textbook being used and the background of the teacher. In many cases the teachers attempted to follow the new course outline. However, they had not so readily adapted their teaching procedures to the new program. Some were reluctant to give up their long-formulated methods. Others felt a need for improved textbooks to enable them to try the new course.

The students in all schools visited were able to enroll in the second semester course before taking the first semester course. Programming difficulties apparently made it impracticable to require a strict sequence of work. In many instances this caused the teachers to deviate from the course outline; regardless of outline, they had to drill on geographic concepts and tools from the earlier semester. This deviation made instruction repetitious since there often were some students who had been exposed to geography in a previous semester. It is believed that as the school system moves to annual admissions, this disadvantage will disappear.

Teachers evaluated the learning ex-

periences suggested in the new course of study by various methods. One type of evaluation was made through the use of teacher-prepared tests which measured pupils' ability to recall specific information such as chief agricultural products, exports, imports, and minerals of certain countries, and to perform certain skills such as recording geographic information on maps, charts, and graphs. Examples of types of tests were true-false, matching, multiple choice, fill-in, and essay tests. In addition to formal testing devices of factual knowledge teachers also used prepared assignments, notebooks, and map drawings. Examples were geographic crossword puzzles, climatic calculation exercises, newspaper and magazine clippings of geographic importance, and place location of countries, cities, islands, rivers, and landforms on maps of the continents. In some classes, but less frequently, teacher evaluation was made of the students' abilities to apply knowledge, think critically, and make generalizations pertaining to geographic concepts. Questions pertaining to the "why and how" of man's relation to his environment were often asked in these classes.

Teachers of Geography

The new program in the Chicago high schools created a greater need than ever before for an understanding of geographical relationships and principles. The available supply of teachers to meet this need was not promising. The total number of geography teachers in the system was small, many of them were not well prepared to deal with a new course, and efforts to enlist new teachers yielded only modest returns.

The most serious problem encountered in carrying out the transition program in the public high schools of Chicago is the lack of qualified geography teachers. The best guess is that Chicago will need about 100 full-time geography teachers in the next year or two.[10]

One standard of qualification is the certification requirement. According to *The Master Standards Pattern for the Certification of the Teachers of Geography as Established by the National Council of Geography Teachers,* a teacher should have 12 semester hours of college training in geography.[11] In 1959, in Chicago, many teachers trained in science, history, or business were teaching geography. Professionally, these teachers were well prepared for teaching, but few were adequately prepared to teach geography if the standard is 12 semester hours of college training in geography. Cases were encountered where teachers with out such formal training were doing devoted and effective work. In the class observation, some other teachers without formal preparation did not seem keenly interested in the subject and showed little concern to learn more of it. These teachers tended to stress facts rather than ideas.

It was found that 43 per cent of the geography teachers interviewed had permanent Commercial Geography certificates. All of these teachers had taught geography for ten years or more. Of the 57 per cent teachers not permanently certified in geography, only 5 teachers had been teaching geography in September, 1958. All of these would have had to take heavy programs of college geography in order to be certified under the Board of Education regulations. Sixteen semester hours in geography are necessary for a temporary certificate. Not one teacher of those interviewed was found to hold a temporary certificate in Geography. No connection was found between the certi-

[10] "Teachers of High School Geography Needed: Can You Qualify?" THE JOURNAL OF GEOGRAPHY, LIX (April) 1960, p. 186.

[11] "The Master Standards Pattern for the Certification of the Teachers of Geography as Established by the National Council of Geography Teachers," THE JOURNAL OF GEOGRAPHY, XLII (February) 1943, p. 41.

fied teachers and the prominence of the geography programs in their respective schools.

After the new requirements for graduation from the secondary school were announced, the Board of Education sought to increase the teacher supply. In December, 1958 the Board of Examiners issued an announcement of an examination for a certificate in geography to be given on April 27, 1959. Following is a statement of requirements necessary for a candidate to quality for the examination:

> A candidate taking the geography examination must present thirty-two semester hours of college credit in geography and related fields. A minimum of eight semester hours must be in PHYSICAL GEOGRAPHY: elements of geography, physical geography, oceanography, geology (basic processes, not historical), meteorology, climatology, cartography, or map and air photo interpretation; eight semester hours in REGIONAL GEOGRAPHY covering major parts of the earth's surface, e.g. Caribbean, Eastern United States, Europe, British Isles; and eight semester hours in TOPICAL HUMAN GEOGRAHY: economic geography, global geography, social geography, transportation geography, urban geography, or conservation. The balance of the thirty-two semester hours may be in any geography the candidate may elect to submit or may be from RELATED FIELDS in courses approved by the Board of Examiners.[12]

This was the first examination of this type to be offered in twenty-four years. Under it, seven teachers were certified in geography. It is apparent from the number of persons (13) who took the examination, and the minimal number of persons who currently hold temporary certificates in geography that the requirements for qualifying are not easily met. This is attributed by some observers to the sparsity of elective courses in geography offered by the colleges.

Because many of the Chicago public school teachers have been educated in the Chicago area, the question of college opportunities is raised. Most of the courses in college geography for which the teachers have credit are in the fields of methods of teaching, principles of geography, and economic geography. In so far as the writer has been able to determine, only Northwestern University and the University of Chicago (in the Chicago area) offered opportunity for a Master's degree in geography in 1959. Several schools offered only a single course, which is designed to meet the minimum requirement for teacher certification. From the existing opportunities, many teachers could not obtain adequate preparation in the field of geography at the college of their attendance. Personal conversation with selected college students in Chicago preparing to be teachers revealed a number who, while anxious to take geography courses, were skeptical as to whether or not they would have an opportunity to teach it after they had completed their preparation. The Board of Education examination announcements may have changed this attitude, but the heritage of earlier times still was strong in 1959.

In recognition of the demand for more geography teachers, Chicago Teachers College will begin, in 1960, to prepare teachers to meet course requirements for taking the geography certification examination by offering a major in geography to daytime undergraduate students, and evening courses in physical geography to in-service teachers. In the past, only five courses were offered as electives to daytime undergraduate students, and only regional geography was offered in the evening to in-service teachers. This is the first step toward replacing substitute teachers who are now teaching geography "off" certificate.

It appears that the shortage of qualified teachers is a product of small numbers already in the school system, of high requirements to quality for certification examinations, and of lack of interested candidates having a substantial amount of college geography.

[12] Chicago Board of Education, "Amended Circular of Information—Board of Examiners," *Board Proceedings*, No. 66406, Chicago, December 23, 1958, p. 701.

Materials of Instruction

Another significant problem encountered during the transition period relates to textbooks. The textbooks which were being used in many of the schools were outdated and unsatisfactory primarily because of their economic treatment. In reality, some of these books were little used in the classroom except as a source of factual and statistical material; they were supplemented by visual aids and teacher-prepared outlines.

The basic objectives of the tentative geography course may be compared with those presented in the textbooks which were being used in practically all of the general high schools in Chicago that offer substantial programs in geography. Good textbooks are one solid aid to an inexperienced instructor without a detailed syllabus and in such instances it may be important that the textbook cover substantially all of the areas pointed up in the course of study. Five textbooks were the principal ones being used by the teachers of geography during the transition period.[13]

These books were reviewed from the standpoint of their suitability for the tentative course. Their use in classrooms was observed, and teachers were asked to comment upon their utility. One was found to cover much the same material as outlined in the course. Two were sufficiently close in organization so that some inexperienced teachers judged them helpful. Two contained useful source material but did not conform sufficiently to the course aims to be used as other than reference volumes. None directly corresponded to the course outline; and while this was not a handicap to experienced teachers, it raised problems with some of those lacking preparation in geography.

The introduction of an expanded geography program in the public high schools of Chicago confronted teachers and administrators with the problem of adequately equipping their additional geography classrooms. The tentative program provides for instruction in the tools which help to develop an understanding of world geography. The essential geography equipment for such work would consist of maps, atlases, globes, furniture, and visual aids.

To achieve the aims set out in the tentative program it would seem necessary to have, at a minimum, maps of Illinois, the United States, and the world. The wall maps suggested by topics in the program are: physical-political, seasonal rainfall, seasonal temperature, vegetation, population density, and blackboard-outline maps.

In addition it would seem necessary for each classroom to be equipped with one atlas for reference in case other maps do not carry the information desired.

Included in the category of furniture are large work tables, dark window shades, display and storage cabinets, and racks for wall maps.

An adequate program of visual aids would appear to include motion pictures, filmstrips, still pictures on slides or mounted for opaque projection, bulletin board displays, blackboards, and large framed pictures for the room.

In the schools visited, it was difficult to tell exactly what equipment was available. However, it was apparent from observation that no geography classroom was fully equipped with the essential materials outlined above. On the other

[13] John Hodgdon Bradley, *World Geography*, Ginn and Company, Chicago, 1957, pp. 1-583.
Charles C. Colby and Alice Foster, *Economic Geography*, Ginn and Company, Chicago, 1954, pp. 1-683.
Sidney E. Ekblaw and Donald J. D. Mulkerne, *Economic and Social Geography*, Gregg Company, Chicago, 1958, pp. 1-415.
Leonard O. Packard, Bruce Overton, and Ben D. Wood, *Geography of the World*, The Macmillan Company, New York, 1953, pp. 1-499.
Norman J. G. Pounds and Edward L. Cooper, *World Geography*, South-Western Publishing Company, Cincinnati, 1957, pp. 1-632.

hand, no classroom was found completely lacking in any kind of wall maps, globes, atlases, or visual aids. The needs were substantial but not distressing. Moreover, in a number of cases it appeared that the teachers were not sufficiently trained to use all the equipment in the classroom.

In view of the current demand by educators for well equipped classrooms and of the purchase program of the Board of Education, it appears that much of the equipment now needed in some classrooms will be acquired in a relatively short time.

Conclusions

The task of developing geographic education in the public high schools of Chicago in 1959, was a large one. The Board of Education had begun to accomplish this task as evidenced by an increase in the number of geography students from 5,195 in September, 1958, to 6,273 in September, 1959, or 17.2 per cent. Although the new requirements for graduation from the secondary school were a major factor in the growth of enrollment in geography, it is less clear that there was qualitative improvement. In some cases no real change in the content or in the method of presentation of the course had, as yet, been effected.

Since the elementary school geography course provides the base for the high school course, geographic instruction at the elementary school level may also be expected to influence the role of the high school course. In 1959, the elementary school work also was in transition and a new program had been prepared and was in operation.[14]

The most serious problem encountered in carrying out the transition program was the lack of qualified geography teachers. One major reason for this lack was the difficulty in meeting the geography course requirements for taking the certification examination. Another reason was the lack until recently of explicit demand for geography teachers. This, in turn, was reflected in the lack of emphasis upon geography in training programs in the Chicago area.

A second problem was the flexibility in programming which permitted students from all four grades, ranging in age from thirteen through eighteen, to be enrolled in the same class. In addition, the students were able to enroll in the second semester course before taking the first semester course.

A third problem was the lack of current textbooks corresponding to the new tentative program in world geography. There also was a lack of properly equipped geography classrooms to accommodate an additional 44 classes since September, 1958.

If the aims of the Board of Education for its new geography program are to be realized, it appears that changes will be necessary at all or some of the following points: (1) more qualified geography teachers must be recruited to replace substitute teachers who have been trained in other subject areas; (2) beginning geography students must be required to take geography 1 before taking geography 2, and should be programmed with students of their own age and grade; (3) a greater selection of geography teaching materials which fully meet the needs of the new course of study must be made available.

A more difficult and less tangible problem to overcome is the attitudes which influence geography as a social studies course. The old Commercial image is strong, and impressions of college entrance requirements are discouraging.

By the spring of 1960, the new program in world geography was under way in the face of serious shortage of teachers. With a relatively flexible course

[14] Chicago Board of Education, *Supplement to Teaching Guide for the Social Studies*, Chicago, 1959, pp. 1-184.

structure and with a modest supply of teaching materials, its performance in the next stage seemed to rest largely upon the quality of instruction, and of teacher and student attitudes toward the course in the years immediately ahead.

"THE LAW OF PRIMATE CITIES" RE-EXAMINED[1]

GEOFFREY J. MARTIN
Eastern Michigan University

Mark Jefferson,[2] one-time astronomer, treasurer and sub-manager of an Argentine sugar estate, and Massachusetts high school teacher, was 34 years of age when, in 1896, he came to study physical geography at Harvard under W. M. Davis.[3] For one decade Jefferson remained under the spell of Davis, taking notes from the master in Greek, Latin, and German, collecting his works, pasting his letters and postcards in albums, traveling many a field mile with the man, and hungrily consuming Davis' every spoken word. In the early 1900's, Jefferson looked only upon the ground; when Davis told him to "look up," Jefferson looked up into the sky and saw there the origin of elements that would modify the earth's surface.

Pioneering in Urban Geography

It was ten years after meeting Davis, and while Head of the Geography Department at the Michigan State Normal College, Ypsilanti, that Jefferson began to realize that there was more to geography than the *geo*. He began to notice people, dwellings, and culture; and to realize that human beings created patterns on the face of the earth. Early in 1907, Jefferson remembered the words Davis had spoken to him, many years previously: "What is a city? Nobody knows what a city is." One year later, in 1908, Jefferson read a paper before the Association of American Geographers at Baltimore entitled, "The Anthropography of Great Cities," subsequently published as a twenty-nine page article in the Bulletin of the American Geographical Society.[4] Albrecht Penck of Berlin, present at the Baltimore meeting, expressed strong approval of Jefferson's work. Davis enthusiastically proclaimed, "Give us some more of this sort of thing."

Jefferson responded over the years with numerous writings: "Man's Distribution over the Earth";[5] "A Hopeful View of the Urban Problem";[6] "Culture of the Nations";[7] "The Anthropography of North America";[8] "The Revolution and the Mexican Plateau";[9] "The Real

[1] The substance of this paper was presented to the 56th Annual Meeting of the Association of American Geographers, Dallas, April, 1960.

[2] For brief accounts of the life of Mark Jefferson, see:

Isaiah Bowman, "Mark Jefferson," *Geographical Review*, Vol. XL (January, 1950), pp. 134-137.

S. S. Visher, "Mark Jefferson, 1863-1949," *Annals of the Association of American Geographers*, Vol. XXXIX (December, 1949), pp. 307-312.

S. S. Visher, "Memorial to Mark Jefferson," *Proceedings Volume of the Geological Society of America, Annual Report for 1949* (1950), 175-176.

[3] Jefferson did study under W. M. Davis and N. S. Shaler in the Harvard Summer School of 1892. However, prolonged study under Davis did not commence until 1896.

[4] *Bulletin of the American Geographical Society*, Vol. XLI (September, 1909), pp. 537-566.

[5] *Educational Bi-Monthly*, Vol. III (June, 1909), pp. 364-372.

[6] *Atlantic Monthly* (September, 1913), pp. 353-358.

[7] *Bulletin of the American Geographical Society*, Vol. XLIII (September, 1911), pp. 241-265.

[8] *Bulletin of the American Geographical Society*, Vol. XLV (March, 1913), pp. 161-180.

[9] *Bulletin of the American Geographical Society*, Vol. XLVI (June, 1914), pp. 436-438.

New York in 1910";[10] "How American Cities Grow";[11] "Range and Township Plan of Roads";[12] "Distribution of People in Japan";[13] "Some Considerations on the Geographical Provinces of the United States";[14] "The Distribution of British Cities and the Empire";[15] "Great Cities of the United States 1920";[16] Cities of the United States in 1910";[17] "Cities";[18] "Distribution of the World's City Folks";[19] "Great Cities of the United States 1930";[20] "Is United States Population Now Diminishing?";[21] "Law of the Primate City";[22] and "Cities of the United States in 1940."[23]

The Law of Primate Cities

"The Law of Primate Cities," (a paper read before the Association of American Geographers at Cambridge in 1938, later published in the *Geographical Review*, April, 1939, as "The Law of the Primate City"), is worthy of renewed study for several reasons. Firstly, the essay was born of a Jefferson who at the age of 76 combined the wisdom and knowledge wrought of experience and travel with the remarkable mental agility which characterized his earlier years. "The Law of Primate Cities" was the product of much thought and composition in human geography, and of considerable travel. Despite the difficulties of movement in Jefferson's earlier years, he managed to journey some 150,000 miles, none of it by air, visiting many urban communities in North America, Central America, South America, the Caribbean, Europe, and Africa[24] (Fig. 1).

Secondly, it is of interest to note a difficulty which confronted Jefferson in his urban work as late as the 1930's which does not bother us so markedly today. He was not always able to acquire the population figures for a country, city, or ward by thumbing through the latest census figures. Very often, statistics were not available, and Jefferson would be obliged to correspond with a person or persons in a position to help. On one occasion he called upon Ellsworth Huntington for assistance in estimating the figures for geographical New York, as opposed to the legal New York. Huntington walked the streets of New York questioning the policemen on the block, questioning city folks of years' standing, in order to derive a population figure for the geographic city. Jefferson wrote to the Post Offices of those countries for which statistics were not readily available, and he wrote to town halls, universities, experienced citizens in his quest for accurate data. A voluminous correspondence testifies to this activity—and all this while he carried an eighteen hour teaching load.

Thirdly, a re-examination of "The Law of Primate Cities" encourages us to remember the contributions of this distinguished scholar to urban geogra-

[10] *Bulletin of the American Geographical Society*, Vol. XLIII (October, 1911), pp. 737-740.
[11] *Bulletin of the American Geographical Society*, Vol. XLVII (January, 1915), pp. 19-37.
[12] *The Journal of Geography*, Vol. XIV (November, 1915), pp. 80-81.
[13] *Geographical Review*, Vol. II (November, 1916), pp. 368-372.
[14] *Annals of the Association of American Geographers* (Presidential Address), Vol. VII (1917), pp. 3-15.
[15] *Geographical Review*, Vol. IV (November, 1917), pp. 387-394.
[16] *Geographical Review*, Vol. XI (July, 1921), pp. 437-441.
[17] Published as a separate, "c1924 Mark Jefferson."
[18] "Chapter Three" *Man In Europe*, Ypsilanti, 1936, pp. 48-78.
[19] *Geographical Review*, Vol. XXIII (January, 1933), pp. 90-100.
[20] *Geographical Review*, Vol. XXI (July, 1931), pp. 446-465.
[21] *Geographical Review*, Vol. XXIV (October, 1934), pp. 634-637.
[22] *Geographical Review*, Vol. XXIX (April, 1939), pp. 226-232.
[23] *Geographical Review*, Vol. XXXI (July, 1941), pp. 479-487.

[24] The author is indebted to Albert Corriveau, graduate student in geography at Eastern Michigan University, for execution of the illustrations.

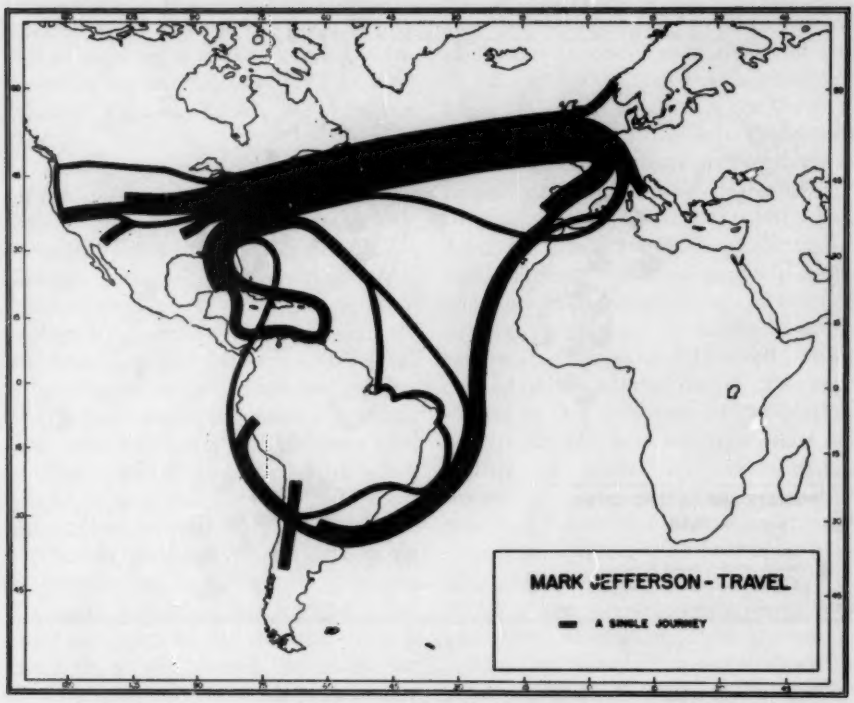

FIG. 1

phy. Jefferson's concept of primacy may be viewed as the logical culmination of all his previous work in this field, wherein he anticipated the published thought of the school of ecological dominance propounded in the late 1920's by McKenzie and Park of the University of Chicago. Yet remarkable has been the rapidity with which urban geographers have forgotten the work of one of their "founders"; meager is the mention Jefferson receives from urban geographers. Indeed, is there any work that has cited fully all Jefferson's contributions to this branch of geography?

Fourthly, a Jefferson who read eight languages readily, benefited greatly from honorary life membership in the geographical societies of the Argentine, Sweden, and Yugoslavia, and also from an extensive correspondence with a host of eminent European geographers whose acquaintance he had made either during his visits to Europe or on the occasion of the 13,000 mile Transcontinental Excursion of the American Geographical Society through the United States in 1912.[25] Jefferson probably borrowed more extensively from the greater sophistication of European geographic thought during the first half of the twentieth century, than any other American geographer. The fruits of this intercourse were subtly scattered before the New World geographer in the form of over one hundred published articles or books. "The Law of Primate Cities" was one such article, penned by a Jefferson handsomely leavened by this European experience.

Finally, the concept of primacy itself is

[25] Mark Jefferson was a Marshall of this Excursion, led by W. M. Davis.

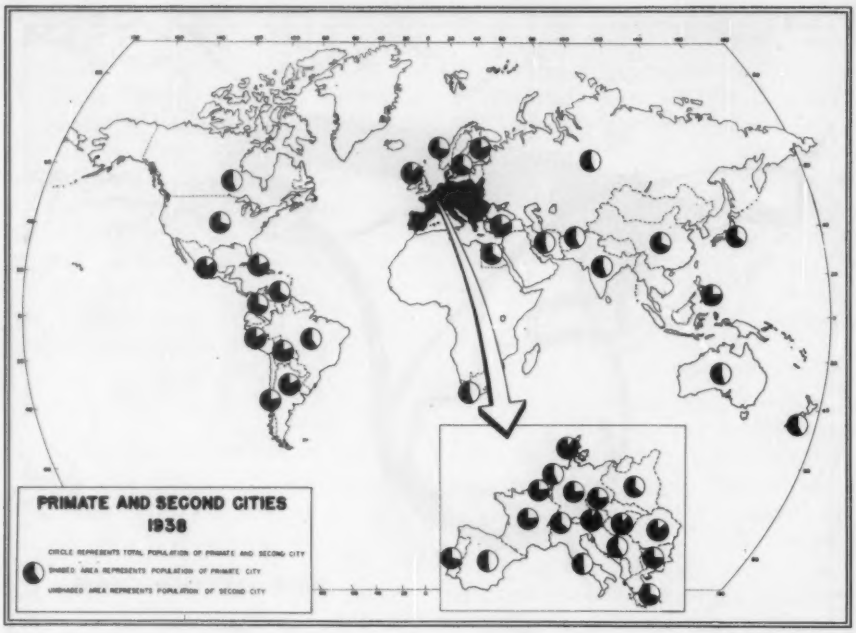
PRIMATE AND SECOND CITIES
1938
CIRCLE REPRESENTS TOTAL POPULATION OF PRIMATE AND SECOND CITY
SHADED AREA REPRESENTS POPULATION OF PRIMATE CITY
UNSHADED AREA REPRESENTS POPULATION OF SECOND CITY

Fig. 2

worthy of renewed study. Jefferson wrote in 1938:[26]

"Metropolitan London is not merely the largest city in the world; it is more than seven times as large as Britain's second city, Liverpool, and thereby stands out alone in a different order of magnitude and significance from that of all other cities in the country.

"The finest wares are always to be found there, the rarest articles, the greatest talents, the most skilled workers in every science and art. Thither flows an unending stream of the young and ambitious in search of fame and fortune, and there fame and fortune are found. London is the kingdom's market for all that is superlative in intellectual and material productions. Its supereminence as a market runs parallel to its supereminence in size. It is the primate city of the United Kingdom.

"In Denmark the less-than-a-million capital, Copenhagen, has won greater relative primacy. It is nine times as large as Denmark's second town."

Jefferson collected statistics of city populations throughout the world. He then selected forty-four of the most advanced countries of the world and compared the population size of the first city with that of the second city. For Jefferson, the forty-four most advanced countries of the world were those that had attained the highest cultural achievement. This presented no special problem to him, as he had been measuring and mapping the culture of countries since 1911. In eighteen of the forty-four cases selected in 1938, he found examples of triple primacy: the first city was numerically at least three times greater than the second city. The triple primates included Vienna, Copenhagen, Budapest, London, Mexico, Lima, Buenos Aires, Bucharest, Havana, La Paz, Helsinki, Santiago in Chile, Brussels, Prague, Manila, Berlin, Paris, and Istanbul. In ten cases Jefferson found examples of double primacy: the first city was numerically twice as large as the second city. The double primates included Sofia, Rio de Janeiro, Oslo, Athens-Piraeus, Lisbon, Vienna

[26] "The Law of the Primate City," *Geographical Review*, Vol. XXIX, *op cit.*

(1910), New York, Bogota, Shanghai, and Stockholm. In six cases the first city was half as large again as the second city. Included in this category were Tokyo, Cairo, Warsaw, Caracas, Zurich, and Tehran (Fig. 2).

The only real exceptions to Jefferson's concept of primacy were the British Dominions, Spain, Italy, and Russia. Furthermore, Jefferson could explain the exceptions: the British Dominions were "able to look 'home' to London as their primate city"; Spain had divided itself into Castilians and Catalans—two capital cities emerged; Italy had not had enough time to grow since the time of its unification; whereas Russia had not been able to develop a capital representative of her people in the absence of a good communications network.

Jefferson further developed the concept of primacy by insisting that the first city draws its inhabitants from all other cities and parts of the country, thus, in character as well as size, expressing the national disposition more completely than any other city. It is the indigene of the city who is narrow and limited—the nation's true provincial. Jefferson cited the case of the cockney as England's true provincial, whereupon *The Times* came spitting back with a defense of cockneys and cockneyism which only helped confuse the law of *primate* cities![27] *The New York Times*,[28] *Detroit Free Press*, and Michigan State Normal *College News* also devoted space to "The Law of Primate Cities."

Since 1908, Jefferson had been mapping the culture[29] of countries using such criteria as schools, patents, cities, communications, railroad freight, foreign commerce, pieces of mail delivered per capita, telegraph, telephones, automobiles, art galleries, societies for the prevention of cruelty to animals. Each country was given a culture index that was presumed to indicate the degree of cultural attainment which that country had achieved. Satisfied with his measuring device, Jefferson proceeded to group countries into four categories on the basis of cultural attainment: Teutonic, Mediterranean, Levantine, and Oriental. These culture indices enjoyed considerable popularity in the early part of the century and encouraged Jefferson to calculate the culture of cities. His investigation showed that cities enjoying a high culture index invariably had a substantial population. Thus, another dimension had been added to Jefferson's concept of primacy: the city was prime in culture and prime in number of population.

This led Jefferson to state that, "A country's leading city is always disproportionately large and exceptionally expressive of national capacity and feeling." This was the law of primate cities, a law Jefferson asserted, by virtue of its constant recurrence the world over in advanced countries. Perhaps it was a little unfortunate that Jefferson, in his enthusiasm for the concept of primacy, should have adopted the term law—a term which the social scientist has concisely defined today as a statement of a relation or sequence of phenomena invariable under the same conditions.

Proportion Technique

In order to facilitate the handling of primacy statistics, Jefferson established what he has termed in his notes the proportion technique. The primate city of a country is given an index of 100; the second city of that same country is expressed as a percentage of the first city.

[27] "Cockney Born," *The Times* (January 11, 1939), p. 13, col. 4 and "True Provincials: Cockneys and New Yorkers," p. 11, col. 4. In this latter column *The Times* confuses a primate city with a primitive city!

[28] "The Primate City," *The New York Times* (June 4, 1939), Sec. IV, p. 8, col. 2.

[29] "*Culture of the Nations*," *Bulletin of the American Geographical Society*, Vol. XLIII, *op. cit.*

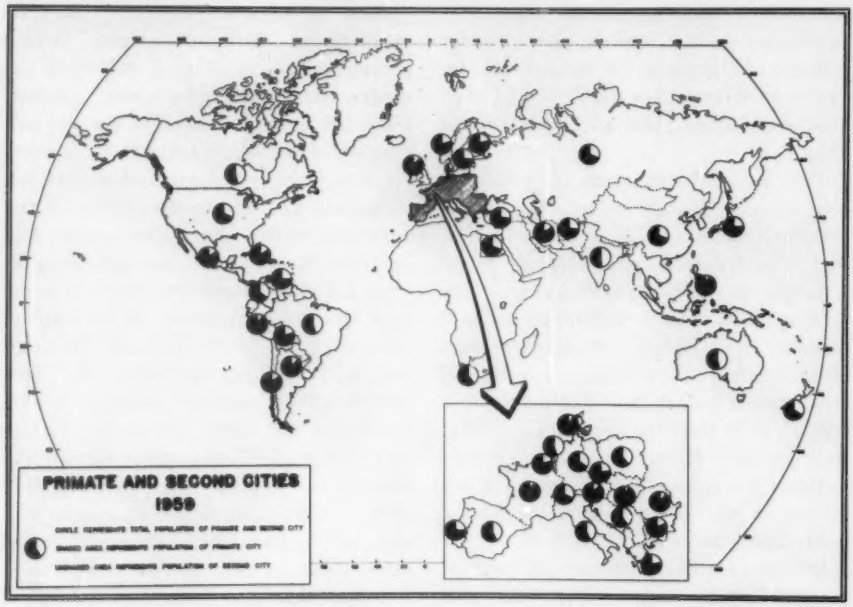

FIG. 3

In this way, the degree of primacy achieved by any first city is readily comprehended.

It is instructive to measure the degree of primacy which first cities have achieved today in those forty-four countries which Jefferson enumerated in 1938 (Fig. 3). Twenty-one cities now exhibit triple primacy (compared with eighteen in 1938), while thirty-one of the forty-four first cities have maintained or increased their degree of primacy over second cities. Furthermore, the mean primate-second city index derived from 1959 statistics is 100:39, compared with 100:46 in 1938. Primate cities have increased their stranglehold over second cities both absolutely and relatively, notwithstanding the special inconvenience which several European primates suffered owing to World War II—evacuation of people, some of whom never returned, disruption of industry and commerce, death and civil destruction. Jefferson's concept of primacy has indeed well withstood the test afforded by the passage of twenty years.

In comparing the degree of primacy which first cities exert over second cities in 1938, and 1959, one encounters the problem Jefferson experienced in 1938, namely, what city population shall be used? Wherever possible, the population figure of the geographical city, that is, the greater city, has been used. *The Statesman's Yearbook* has been the source of information both for the 1938 and 1959 figures, an arrangement which encourages a consistent comparison.[30]

Summary

The concept of primacy has become familiar to the geographer, but we would do well to remember that we are as dwarfs seated on the shoulders of giants;

[30] *World Almanac* 1959 figures were adopted in those instances where they were considerably more recent than those offered in the *Statesman's Yearbook 1959*.

TABLE 1

PRIMATE AND SECOND CITIES, 1938 AND 1959*

Country	First City	Second City	1938 Indices	1959 Indices
Austria	Vienna	Graz	100:8	100:14
Denmark	Copenhagen	Aarhus	100:11	100:10
Hungary	Budapest	Szeged (1938) Miskolc (1959)	100:13	100:8
United Kingdom	London	Liverpool (1938) Birmingham (1959)	100:14	100:13
Mexico	Mexico	Guadalajara	100:18	100:15
Rumania	Bucharest	Chisinau (1938) Cluj (1959)	100:18	100:13
Peru	Lima	Callao	100:20	100:11
Argentine Rep.	Buenos Aires	Rosario	100:22	100:16
Turkey	Istanbul	Izmir (1938) Ankara (1959)	100:23	100:37
Cuba	Havana	Holguin (1938) Marianao (1959)	100:25	100:19
Bolivia	La Paz	Cochabamba	100:26	100:26
Finland	Helsinki	Viipuri (1938) Tampere (1959)	100:26	100:27
Chile	Santiago	Valparaiso	100:30	100:16
Belgium	Brussels	Antwerp	100:30	100:26
Czechoslovakia	Prague	Brno	100:31	100:31
Philippines	Manila	Cebu	100:31	100:8
Germany	Berlin	Hamburg	100:32	100:54
France	Paris	Marseilles	100:32	100:10
Bulgaria	Sofia	Plovdiv	100:35	100:22
Norway	Oslo	Bergen	100:39	100:24
Greece	Athens-Piraeus	Thessaloniki	100:40	100:29
Portugal	Lisbon	Oporto	100:40	100:36
United States	New York	Chicago	100:43	100:46
Colombia	Bogota	Barranquilla (1938) Medellin (1959)	100:43	100:55
China	Shanghai	Peking	100:44	100:45
Sweden	Stockholm	Goteborg	100:48	100:35
Japan	Tokyo	Osaka	100:51	100:32
Egypt	Cairo	Alexandria	100:52	100:45
Poland	Warsaw	Lodz	100:53	100:64
Venezuela	Caracas	Maracaibo	100:55	100:34
Switzerland	Zurich	Basel	100:59	100:47
Iran	Tehran	Tabriz	100:61	100:19
Brazil	Rio de Janeiro (1938) Sao Paulo (1959)	Sao Paulo (1938) Rio de Janeiro (1959)	100:66	100:86
Yugoslavia	Belgrade	Zagreb	100:70	100:67
New Zealand	Auckland	Wellington (1938) Christchurch (1959)	100:70	100:51
Afghanistan	Kabul	Kandahar	100:75	100:37
Netherlands	Amsterdam	Rotterdam	100:76	100:83
Soviet Union	Moscow	Leningrad	100:76	100:45
Canada	Montreal	Toronto	100:77	100:84
India	Calcutta	Bombay	100:79	100:95
U. of S. Africa	Johannesburg	Cape Town	100:80	100:65
Australia	Sydney	Melbourne	100:80	100:85
Spain	Barcelona (1938) Madrid (1959	Madrid (1938) Barcelona (1959)	100:91	100:76
Italy	Rome	Milan	100:96	100:75
		Mean Indices	100:46	100:39

* City indices in this table have been calculated by way of Jefferson's proportion technique.

we see more things than the ancients and things more distant; but this is due neither to the sharpness of our own sight, nor to the greatness of our own stature, but because we are raised and borne aloft on a giant mass of geographic knowledge acquired through the careful research of others.

We may well have been guilty of neglect in our acknowledgment of Mark Jefferson as one who helped bear aloft contemporary urban geography.

COLLEGE GEOGRAPHY OVER CLOSED-CIRCUIT TELEVISION

ROBERT E. CRAMER
East Carolina College

CLOSED-CIRCUIT TELEVISION may be the answer to our expanding school population, and to the limited supply of well-trained teachers. To study the applicability of this method of instruction East Carolina College has been conducting TV classes in large introductory courses and attempting to analyze the results. Now in their third year, the closed-circuit television classes are being accepted slowly by both faculty and students for the teaching of some courses with large enrollment. Whether this method of instruction remains permanently on the East Carolina College campus has not been decided.[1]

The purpose of this paper is to report on the achievements and effectiveness of the closed-circuit television class in geography, and as much as possible to compare this class with the conventional geography classes taught during the same term. Throughout this report there are dispersed comments reflecting the attitudes of students toward this method of instruction, as well as comments on a few of the techniques and methods used in the experiment.

The course, Introductory Geography, was presented during the spring quarter of 1959.[2] Granting five quarter hours, the course met eleven weeks, Monday through Friday for fifty minutes, and was conducted as a lecture course. There were 125 students taking the course on TV and 230 students taking the same course in eight sections under five instructors by means of conventional instruction. All instructors were issued an outline of the course listing topics to be taught each day, but no controls were imposed, except that the instructors agreed to cover specific chapters in the textbook and to give common mid-term and final examinations.[3]

At the end of the quarter, results showed that two large TV sections in college geography could be taught both

[1] East Carolina College, Greenville, North Carolina is one of the nine institutions of higher learning which were offering geography over television in 1959, and possibly the only school offering a strictly closed-circuit course in college geography. In any case, the class met for more weeks, a longer daily period, and gave instruction to more geography students than any class offered by any other college or university in the United States. This is substantiated by Lawrence McKune, editor, *Telecourses for Credit*, Vol. 6, Michigan State University, East Lansing, Michigan, September 1, 1959. The 1960 edition of this publication listed seven institutions of higher learning offering twelve television courses in geography. None of these courses appeared to be a closed-circuit television course.

[2] The textbook used in this course was one with a systematic plan: H. M. Kendall and R. M. Glendinning, *Introduction to Geography*, Harcourt, Brace and Company, New York, 1957.

[3] Probably the only way to obtain a true controlled study comparing achievements of television students with students in the classroom is to have one person teach the same lesson to both classes. Only in this way would there be a true control and completely valid comparison. The writer will conduct such a controlled experiment in the Fall of 1961.

efficiently and effectively; and in common examinations, grades for the TV students averaged as high as for those who were taught in the conventional classroom. Some TV students stated that they thought the geography TV class was more interesting and clearer than the usual classroom instruction, because of the better prepared lectures and more effective use of visual materials. The many who spoke out against TV expressed the feeling of being "cheated" and complained most often about the lack of student-teacher discussions and the impossibility of asking questions during the lectures.[4] Students did not seem to appreciate that, in large conventional classes, student-teacher discussions also would be limited or cease to exist, and neither would there be much opportunity for questions from the class.

The student opposition to television classes appeared to be the result of several factors: poorly handled television courses when closed-circuit television was first introduced on the campus; students' attempt to explain lower grades than they thought they deserved; and finally a natural protest against a deviation from the usual. This negative attitude seemed to have had very little effect, however, on final grades and apparent over all achievements, when comparisons were made with the conventional geography classes.

We are constantly being made aware that college enrollments will continue to increase, and of the staggering figures which are predicted for 1970. Some method must be found to handle the large numbers enrolling in introductory courses, especially if they are required courses, as is geography at East Carolina College. The East Carolina College on-campus enrollment is over 4,500 students, and introductory geography sections average fifty students. This figure is increasing each year. The answer does not seem to be to hire additional teachers each year, because in a situation as now exists at East Carolina College there is not enough demand for additional elective upperclass courses, and most teachers are not satisfied to teach only two or three sections of introductory geography.[5]

What is suggested in this report is that large television classes for introductory required courses may well relieve the pressure being placed upon undergraduate colleges where graduate assistants are not available to assist or supplement the faculty. Instead, part-time senior students could give inexpensive assistance as proctors, while one or two professors lecture from the campus television studio.

Pros and Cons of Teaching Geography over Television

By its very nature, television tends to encourage the conscientious instructor to organize and plan more carefully each lecture. The television instructor, in contrast to the instructor in the conventional classroom, must hold the attention and interest of the students solely through his lecture, gestures, and use of visual aids. Since there are no interruptions and distractions from students, the TV instructor frequently can cover more material than is covered during the same amount of time in the conventional classroom.

The criticism of television stated by many students at East Carolina College was that they could not interrupt the

[4] Telephones were installed in the TV classrooms enabling students to communicate directly with the TV instructor. This medium, however, was not made available to the geography students, but it was used in some other courses.

[5] One should realize that when a class enrollment exceeds approximately thirty-five, it ceases to be a small class with small class advantages. By offering the course to a large class over television, one is able to utilize some of the audio-visual techniques possible with the small class that would not be feasible in the typical large class of today.

lecture to ask questions. It was the opinion of the geography TV committee[6] that this was not a serious problem because some arrangements can be made to answer questions.[7] In addition, an experienced instructor can anticipate most questions that will arise in his lecture, and he knows which areas of subject matter require more attention. Consequently, he spends adequate time explaining these topics and using gestures which his experience has taught him are effective. This situation is not unique to TV teaching; in large conventional classes questions which interrupt the lecture tend to be discouraged or held to the end of the period.

There is no question that an entirely different approach from the conventional classroom technique is encountered in the presentation of geography over TV. One is restricted in movement while lecturing, the hot studio lights may be annoying, there are not stimulating contacts with students, and since there is no class response there is little incentive to joke or relate personal experiences that might enliven the class. Most instructors, however, can adjust to the situation. For example, at East Carolina College two geography instructors who had no previous experience on television became confident and relaxed after the seventh or eighth lecture, and were able to smile and to insert quips now and then in their lecture. Some teachers cannot lecture without an audience and find larger classes tend to stimulate better lectures. Others cannot relax before the TV camera, stand without moving, and find it necessary to read the lecture. This may complicate the situation even more, because if the instructor cannot imagine the audience to which he is lecturing, he reads his notes in a monotone with little feeling. An instructor who finds television that difficult should not be encouraged to use the medium.

Television geography is a "natural" for using visual materials.[8] In the conventional classroom one is likely to disregard using a few scenes from a filmstrip which would illustrate a point discussed, or forego several slides which would greatly enhance the lecture, because time is lost in darkening the room and in operating the projector. Therefore, the classroom teacher tends to use visual materials only when time is available for extensive viewing. On TV, a cue from the instructor will bring any filmstrip scene, slide, clipping, or motion picture film into view. There is no class time lost, and one or many pictures can be seen whenever desired and for any length of time.

In addition, the television camera can give a detailed closeup of any visual material, such as graphs, pictures, maps, or globes. The student is then able to see details that could not be seen in the regular classroom unless he sat in the front row, or unless the material were circulated in the room.

Although some program directors insist on a detailed listing of all movements of the instructor, timing on each aid, and even rehearsals, those of us teaching on TV at East Carolina College found that it worked satisfactorily simply to list the sequence of visual materials to be used. It was necessary, however, to note on this list some details as to the specific area of the map or picture which would be discussed, and, therefore, should be enlarged. With this brief script in the hands of the director, the TV lecturer could call for any visual materials he

[6] The geography TV committee of East Carolina College consisted of the writer as chairman and Drs. Morton Winsberg and Donald R. Petterson.

[7] Arrangements were made in this experiment to have proctors answer questions for five minutes after each TV lecture.

[8] The use and effectiveness of visual materials are well discussed in *Geography via Television* by Jewell Phelps, National Council for Geographic Education.

needed with verbal cues, such as "Let us look at this map," or "Here is a picture illustrating . . ."[9]

A major criticism against the intensive use of audio-visual materials is that there is too much work involved in planning and preparing the material. True, the preparation of some aids did require considerable work, but at East Carolina College cartography students in the Geography Department and an art assistant to the TV Director prepared the more complicated aids. Filed away in drawers, these aids can be used again or improved when time permits.

Another criticism in the use of visual materials is that color will not show on the ordinary TV set, and therefore materials frequently must be redrawn so that the shades of gray are discernible.

There is one final point to mention in favor of television. After a master teacher becomes proficient and comfortable in the use of television, an unlimited number of students can benefit from his teaching. They are not subjected, therefore, to inexperienced assistants, or to teachers who have little interest in or desire to teach introductory courses.

The Closed-Circuit TV Experiment at East Carolina College

In 1958 the North Carolina Legislature appropriated $75,000 to East Carolina College for experimentation with its own classes as to the practicality of teaching over closed-circuit TV. A television studio and control room were installed on the second floor of the college library, and in the fall of 1958 the first television courses were given.

Unfortunately, the early classes were poorly planned by academic departments inexperienced in TV instruction[10] and feeling against television courses grew, both on the part of the students and faculty. Therefore, students tried to arrange their schedules to avoid TV classes during the winter quarter. By the spring quarter the administration decided not to indicate which were TV classes on the class schedule sheets. Four classes in Introductory Geography had been scheduled for the second period, and a professor was listed for each section. These second period students, totaling 125, assembled the first day of class in an auditorium, and they were told for the first time that this would be a TV class. The moans and groans were loud and uninhibited!

The "trapped" students included 73 per cent freshmen, 17 per cent sophomores, and 7 per cent juniors and seniors. Of this number 75 per cent had had previous TV courses. Of that group 37 per cent had two previous TV courses, 8 per cent had four previous TV courses, and 5 per cent had five previous TV courses. Some were taking other TV courses during the spring, concurrent with geography.

On the first day the TV students were asked to write their reactions to being assigned to a TV class. Sixty-five per cent of the students went on record as being disappointed.

Some of the comments were: "I am disappointed that we were not told this would be a TV class. I realize it would have prevented many students from signing up for it, but this fact alone seems to prove that no one likes the TV classes, and that they have not been successful."

"I am disappointed in TV because I

[9] The writer used this technique successfully when he offered a world geography course for credit over the local TV station WNCT during the fall of 1955. This course met for 12 weeks every day for 30 minutes and granted three quarter hours of credit.

[10] For example, in some classes lectures were given three days a week on TV and the remaining two days that week were spent in the classroom elucidating the TV lectures. In other classes a different lecturer was used every two or three days.

made the lowest grade I have made here on TV."

"I do not like courses taught over TV. The lecturer changes too much, and every time you get a new instructor you have to learn how to take notes under him."

Nine per cent of the students expressed outright anger, and most said they would try to transfer out of the section. All of these students had had previous courses on TV. Several complained that it hurt their eyes to look at TV.

The sixteen per cent of the students who seemed indifferent were about equally divided between those who had had previous TV courses, and those with no previous TV courses. An interesting comment: "I was hoping not to get a course on TV since I have heard so much against it from other students. However, I am willing to try it in order to make a decision from my own experience."

Only five per cent of the students responded favorably. A lone student had this most cheerful attitude: "I feel that it will be a new experience in my schooling."

Four per cent did not answer the question.

The four classes meeting the second period were combined into two TV sections, and assigned to two large classrooms: the Library auditorium and the Flanagan Hall auditorium. In each of these auditoriums four 21 inch television sets were strategically placed. It was obvious from this experiment that a TV classroom should be specially constructed, and that most conventional classrooms are not satisfactory for this medium of teaching.[11]

An instructor who did not lecture over television was assigned as permanent proctor in the Library auditorium, which held a class of fifty-two students. The other section of seventy-three students met in the Flanagan Hall auditorium where the remaining three instructors rotated as proctors. These latter three instructors took turns lecturing to the students over television.

At the end of the quarter, the TV sections were polled as to their opinion concerning the number of instructors who lectured on TV. Half of the students said they would have preferred to have only one professor throughout the quarter. As a sophomore who had taken five TV courses remarked, "They don't change in a regular classroom. About the time you get acquainted with one teacher's method, you have to start all over again."

Twenty-six per cent of the students said that they would rather have several lecturers. One comment on this was, "You get tired of looking at the same face all the time."

Perhaps two lecturing professors would satisfy both groups. This would mean there would be only one change for the student, and neither professor would be overburdened with TV preparations.

Through observation and talking with the students before geography was offered on TV we realized that holding attention was a major problem; students tended not to pay close attention to the TV lectures, and slept or did other assignments during the class. To counteract this, we decided to lecture on the air for only forty of the allotted fifty minutes. The classroom proctor would then devote five minutes to answering any questions that had come up during the

[11] For example, the conventional classroom lights produced a glare on the TV sets. It was a problem to decide if the lights should be kept on to prevent eye strain while taking notes, or to turn them off in order to eliminate glare on the TV sets. Also, it was found that acoustic tile on the ceiling of the Library auditorium eliminated vibrations and it was much easier to hear in that auditorium than in the Flanagan Hall auditorium which did not have acoustic tile.

lecture and finally give a five minute quiz on material covered that period. Although the only planned comparison between the TV and non-TV classes was a common mid-term and final examination, it was decided that all classes of Introductory Geography (both TV and non-TV) would have these five minute quizzes covering material discussed that day. Originally questions for these five minute tests were suggested by the television lecturer, but it was found that class instructors preferred to use their own questions. We felt the actual questions were not the important factor, but rather the quizzes were to be a devise to keep the students alert and to call their attention to important points covered during he lecture that day.[12] Also, if all classes gave the five minute quizzes there would be a more close alignment in minutes spent in lecturing in both TV and non-TV classes.

In the TV class the quiz grades were recorded, both in the instructor's grade book and on charts posted in the auditoriums, and these grades contributed to the final grade of the quarter. In the non-TV classes most instructors used the quizzes in averaging their final grade, but they expressed the opinion that there was little need for this technique, and most of them considered the five minute quiz to be a nuisance. However, in the final unsigned questionnaire, ninety-five per cent of the TV students commented enthusiastically in favor of the five minute quizzes. A junior with two previous TV classes said, "It made me more alert and the lectures seemed more interesting. It aided me in classes and in studying for the tests."

The several comments against the quizzes indicated that some students felt tense, trying to catch every word of the lecture. A few students recommended quizzes at the beginning of the period covering the material discussed the preceding day. Others suggested a quiz only once or twice a week.

Finally, a few comments should be made regarding the liberal use of visual materials in this experiment. As has been pointed out earlier, television tends to encourage the use of visual materials because of the ease and speed with which these visual materials can be shown. For example, pie-graphs were used instead of percentages given verbally or in written figures on the board. Areas being discussed were outlined on large blackboard maps with chalk while the lecture was in progress. Also used were movies, filmstrips, pictures, printed names tacked or taped on the map as the topic was being discussed, and especially prepared maps and charts made on blue paper (white paper can prevent a glare on the TV screen). Students welcomed planned audio-visual aids, and many commented that it made the course far more interesting than other TV courses using only a straight lecture. If visual materials are not used, a lecture given on radio would be just as effective as on TV.

Conclusions on the Experiment

An objective evaluation was made through the comparison of common examination grades in both TV and non-TV classes. It was found that the TV classes followed approximately the same pattern as the non-TV classes, both in the mid-term and final examinations, despite the fact that the TV lectures were shorter by five minutes each day than the conventional classes.[13] We found a great deal more difference in average scores among the non-TV classes taught by different professors

[12] It was not feasible to insist on the same questions for all classes because all instructors could not maintain the same pace and emphasis.

[13] The TV class period consisted of a lecture for forty minutes—five minutes for answering questions and five minutes for the quiz. In the non-TV class forty-five minutes were given to the lecture, and five minutes to the daily quiz.

TABLE 1

Final Examination Grades

(per cent of students in each grade category)

Grade	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	TV Flanagan	TV Library
A	0	4	3	5	4	0	0	4	2	4
B	12	11	16	14	15	8	8	8	13	8
C	21	11	22	10	31	21	20	26	24	22
D	41	28	25	43	19	33	56	23	24	30
F	26	46	34	28	31	38	16	39	37	36
Total %	100	100	100	100	100	100	100	100	100	100
Mean score	76	70	76	74	76	72	74	74	72	74

than between the TV and the average of the non-TV classes.

The mid-term examination comprised both objective and subjective questions, and was compiled with the assistance of four instructors. This test was issued to the instructors several days before the examination date. It was the objective final examination, however, that was compiled with total cooperation which permitted the best overall comparison (Table 1). Five to ten questions were submitted by each instructor teaching the introductory course. One instructor not teaching this course selected and edited these questions without further help from the other instructors. No one saw the final examination until the day it was given to the students.[14] The purpose of this arrangement was to prevent any instructor from inadvertently discussing test questions before the examination, and thus permitting each class to have equal opportunity in the examination. The results showed a range of mean scores from seventy to seventy-six with an overall mean of seventy-four. The Library auditorium class had a mean score coinciding with the total mean, while the mean score for the Flanagan auditorium class was two points below the total mean.

[14] Instructors giving this test were dissatisfied with this technique because the editor of the examination had no way of knowing which questions submitted had been covered by all instructors. This fact undoubtedly accounts for the low grades noted in Table 1.

Another examination held between the mid-term and the final was especially significant. One professor had taught the television class for three weeks, concurrently with a regular class which met the hour preceding the TV presentation. He gave the same lecture both hours, used the same visual materials, and give the same questions in the five minute quizzes at the end of the hour. The results of the examination covering this three week period were remarkably similar for the two TV sections and the one conventional class: the TV classes had a median score of seventy and seventy-one, while the conventional class had a median score of seventy-two.

Although new in television teaching, this instructor enjoyed the TV sessions, and his attitude was reflected in the reaction of the students. Television students were just as avid in their praise of him as a geography instructor as were the students in his conventional classroom. It should be noted that this instructor, although a popular lecturer, did not use many audio-visual materials.

Several questions were asked at the conclusion of the TV courses in an attempt to learn students' final attitude toward this technique of instruction. Whereas sixty-six per cent of the students on the first day of the course expressed displeasure or disappointment in being placed in a TV section, only fifty-one per cent of the students reporting in the

final questionnaire said they did not care for television teaching. This difference may appear insignificant, and one may think that the experiment was a failure, but the change in attitude during the quarter was obvious in the classroom. During the first days of the course there was genuine discontent and hostility, but as the course developed there were many who were still "against it," but "it wasn't too bad." Probably the biggest single about face came from thirty per cent of the students who admitted on the last day in unsigned questionnaires that they were not so disappointed in the class as they had anticipated.

Most of the comments expressed by those still discontented with TV revealed resentment at being placed without their knowledge into a television course, rather than dissatisfaction with the type of geography course offered.

A statement illustrating this resentment is:

"I am tired of being shoved around by the staff. I just got out of the Army, and they didn't push me around as much as this college."

The following revealing statement indicates that some students did not put forth their best efforts from the beginning and simply refused to accept the course seriously: "I did not like the course because you did not curve the grades. You knew that we were suffering from the handicap of taking a TV course."

One cannot help speculating on the final attitude of the student had this been the first TV course given to students before prejudiced feelings developed. On the other hand, our TV geography class would not have benefitted from mistakes made in the earlier classes.

Some of the comments in favor of the TV courses are as follows:

A sophomore with four previous TV courses said, "I felt that I learned as much or more than I would have in a regular classroom because of the effective presentation of materials and visual aids."

A junior with no previous TV courses said, "I found that I paid much closer attention in the TV course than I did in the regular classroom."

A junior with no previous TV experience said, "It was plainer than I thought it would be and looking at TV every day is not as tiresome as I thought it would be."

A student with three previous TV courses said, "I don't feel the same way now. I know students in non-TV classes, and they have not had the advantages we have."

A sophomore with no previous TV classes said, "I was disappointed at first, because of the many unfavorable comments I had heard about TV. Now that I had a course I don't really object to anything except the impersonal touch."

As a final check on attitude, students were asked to compare the effectiveness and interest of the television geography course with other courses they were taking or had taken over television. Seventy per cent of the students answering this question favored geography over other TV courses they had taken.

Summary

From the geography experiment conducted over closed-circuit television at East Carolina College, it was apparent that large introductory geography classes can be taught as effectively over television as in the conventional classroom. This medium of teaching may develop into an accepted method for introductory lecture courses where large enrollment is the rule, and when graduate assistants are not available. It is obvious that television could not be used satisfactorily in advanced courses where discussions are essential.

Some of the things that seemed sig-

nificant in any success or advantage the TV sections may have enjoyed include: better course outline (and syllabus); more careful preparation of lectures; better use of visual aid materials; use of instructors most interested in that subject; and fewer interruptions that might sidetrack the instructor and cajole him into deviating from his prepared lecture. In all but the last, each of these improvements over normal classroom procedure strongly suggest that conventional classes, too, would benefit from the special preparations made for the TV sections because these are not benefits which are restricted to the TV classes only. One is tempted to ask whether or not instructors become slack and take their conventional classes too much for granted? Perhaps, by extension, the exacting preparation for a TV section would be a good exercise to stimulate and sharpen any teacher into better practices for his conventional classes.

Teaching over television will be opposed by many because of interference with their teaching routine by "gadgets" and "mechanical contrivances," the dissatisfaction with conforming to schedules, and most important, the lack of personal contacts with students. Also, serious problems may be encountered if television courses are not introduced correctly from the beginning, and much study is needed to prevent strong prejudices against television which may ruin a school's program.

But whether we like it or not, we must face the obvious: that in the near future probably all large college classes, notably required freshman classes, must turn to a mass medium of education. Closed-circuit television is one such medium which is proving successful.

METEOROLOGICAL HISTORY IN THE TEACHING OF WEATHER

DONALD H. LOKKE
Fort Worth, Texas

STUDY OF THE history of meteorology must not be left to the historian alone. Students should have direct contact with the fascinating events in the development of meteorological knowledge. Weather in the elementary grades can become an exciting adventure as its historic events are interwoven throughout the regularly scheduled courses in science and nature. High school and college students will develop a deeper appreciation for the present day status of meteorological knowledge through library historical research.

Historic Investigations

The history of upper air investigations is an example of the meteorological adventure provided through books. Descriptions of manned balloon flights may be found in the earlier issues of weather publications. The Meisinger Award, established in 1924 by the American Meteorological Society, is given in the memory of one of our most outstanding and courageous young students of weather who was killed during a thunderstorm while obtaining weather data in a manned balloon. The story continues as radiosondes later reduced the risks in providing weather data from higher altitudes. Upper air soundings were made with this type of instrument during the Second World War. Radar in the form of RAWIN was an additional refinement in adding information on wind direction and speed using reflections from aluminum foil or metalized nylon mesh carried

beneath a radiosonde transmitter. Once again, the science of upper atmospheric research has advanced with the regular launching of Arcas rockets that sample the atmosphere up to 200,000 feet. A student will have a greater appreciation of the efforts made in obtaining accurate weather forecasts when he is aware of a few of the details of this historical background.

Another interesting historical sequence is the series of events recorded in the development of cloud classification through the years. An account of Lamarck's and Luke Howard's cloud groups set up in 1802 and 1803 may be followed by information found in the *International Cloud Atlas* of 1939, and the revision in 1956.[1] Current thoughts on cloud classification based on droplet size may be found in the *Compendium of Meteorology*.[2] Books on cloud physics focus atention on the role of physical studies in the description of clouds. A vast amount of detail on cloud classification can be pleasantly absorbed by the student through such a study.

The development of meteorological instrumentation is another fascinating aspect of progress as traced in books and journals. Many recent discoveries and techniques have awaited the invention or improvement of a particular weather instrument. The hygrograph, thermograph, barograph, raingauge, and anemometer all exhibit interesting histories. Radio and teletype have been indispensible in the development of weather maps and forecasting.

It is not necessary to search long for additional subjects suitable for historical investigation. Consultation in the *Compendium of Meteorology* will be an excellent place to start investigation on most of the following subjects:

1. Hurricane research
2. Tornado research
3. Thunderstorm and hail research
4. Cloud modification and rain-making
5. Long-range forecasting
6. Development of the frontal theory
7. Tropical meteorology
8. Radar meteorology
9. Sferics research
10. Cloud physics

Interest in Historic Events

In addition to instruction by the teacher and investigation by the student, book displays aid in building up interest in historic events. Teachers and students may cooperate with librarians in their construction. A meteorological book display created by Mr. Roy L. Kidman, now Assistant Director, Howard-Tilton Memorial Library, Tulane University, illustrates the content and fascinating subjects available for portrayal in a book exhibit. His display of several years ago was located in the Science Library at the University of Kansas, Lawrence, Kansas. Students had the opportunity to inspect books such as Aristotle's *Meteorologica* and John Dalton's *Meteorological Observations and Essays*. A facsimile of an English Almanac for the year 1598 and Robert Boyle's *A Continuation of New Experiments Physico-mechanical Touching the Spring and Weight of the Air and their Effects* were also included. A copy of the Baskerville's Edition of Virgil's *Georgics* represented one of the earlier stages in meteorological history. Also displayed were Edme Mariotte's *Oeuvres* dated 1740, and an 1897 translation of Carnot's *Reflexions sur la Puissance Motrce du Feu*, published in 1824. Several volumes of Wolf's *A History of Science, Technology, and Philosophy in the 16th and 17th Centuries* were left open to illustrations of meteorological instruments. (A Harper's reprint[3] of this work

[1] World Meteorological Organization, *International Cloud Atlas*, Vol. 1 and Vol. 2, Geneva, Switzerland, 1956.

[2] American Meteorological Society, *Compendium of Meteorology*, Boston 8, Massachusetts, 1951, 1334 pp.

[3] A. Wolf, *A History of Science, Technology, and Philosophy in the 16th and 17th Centuries*,

FIG. 1. Mr. Roy L. Kidman looks over a portion of display dealing with later phases of meteorological history. (Photo by Harry Wright, University of Kansas Photographic Bureau.)

now makes it readily available in paper bound volumes.) Torricelli's barometer, the Celsius thermometer, and Hooke's hygrometer were shown in this manner. The quotation of weather proverbs in several languages was another interesting feature of this exhibit and appropriate comments on each displayed item aided in placement within the sequence of historic events.

The first set of Mr. Kidman's display cases concentrated on early history, and the second set gave glimpses into the development of cloud classification and weather maps. Tornadoes and the use of radar in thunderstorm detection were also portrayed. The Beaufort scale was shown with an explanation of its origin in the early 19th Century. Meteorological exhibits of this type will encourage historical curiosity.

In describing and displaying meteorological history for students of the elementary grades, one should recommend concentration on the more graphic, adventurous, and recent phases of history. For the high school students more detailed information may be provided on these subjects. College coverage could be similar to Mr. Kidman's, with additional material to follow up on subjects where intense interest has been stimulated.

Smaller libraries may not have access to all of these books, but most of them will be able to provide some books of historical interest. The use of historical sections in meteorological textbooks will give a fine starting point. Inter-library loan may be the source of many additional books and government depositories have the *Monthly Weather Review*,[4] which is filled with a wealth of very readable information and illustrations. George Nepier Shaw's three volume work also contains an excellent collection of historical data.

Teachers with limited time or inadequate library facilities will want to use historians summaries where they are

Vol. 1 and Vol. 2, Harper & Brothers, New York 16, New York, 1959.

[4] Monthly publication of the United States Weather Bureau available from the Superintendent of Documents, Washington 25, D.C.

available. To bring these subjects up to date, first-hand information should be obtained from the more recent issues of *Weatherwise*,[5] *Weather*,[6] *Bulletin of the American Meteorological Society*,[7] and the *Monthly Weather Review*. Historical knowledge, when interwoven throughout classroom work and exhibits on weather, climatology, or meteorology, will be a stimulant in the student's quest for additional information about our earth's atmosphere.

[5] Bimonthly publication of the American Meteorological Society, 45 Beacon Street, Boston 8, Massachusetts.

[6] Monthly publication of the Royal Meteorological Society, 49 Cromwell Road, London, S.W. 7, England.

[7] Monthly technical publication of the American Meteorological Society, 45 Beacon Street, Boston 8, Massachusetts.

ARE THESE THE GENERAL EDUCATIONAL AIMS OF GEOGRAPHY?*

HENRY J. WARMAN
Clark University

GEOGRAPHY is concerned with the areal patterns of physical and cultural phenomena. In the interpretation and evaluation of these phenomena, in both their separate and spatially interacting roles, several specific aspects of the subject are treated. Students learn about the variety and complexity of the natural environment, the nature and distribution of resources and people, the need for and the methods of conservation, the cultural and social differences from place to place, the patterns and growth of urban and rural communities, and various inter-cultural problems.

Through a detailed study of regions, ranging from small communities and areas to the state, the nation, and eventually the world, the ever-widening path of geographic knowledge is traversed. Such information about our land and the world affords background for a much needed better understanding of the efforts and imperativeness of our government to supply wise leadership.

An integral part of geography as it seeks to study areal patterns and interrelationships is the map. In a sense the map may be thought of as a third tool, comparable to language and numbers. With the map, plus the associated techniques of graph, chart, and diagram, the geographer is able not only to learn more but, what is most important, to express his knowledge of places at a particular time and through time.

In conclusion one final general aim of geography might be found in the statement, "To be educated as a citizen one ought to have in one's mind a working sketch map of the world one lives in, and to have a general notion of where one stands in relation to the physical economic, historical, and sociological processes going on around one." Geography, with its emphasis upon place and the significant attributes thereof, strives to accomplish this.

* EDITOR'S NOTE: It is hoped that this short statement will encourage others to write briefly about "What geography is," "What it should be," and "What it is trying to accomplish."

IMPROVING THE USE OF MAPS IN THE ELEMENTARY SCHOOL

ROSE SABAROFF
Oregon State College

A MAP IS A shorthand record of a mass of geographic knowledge which would require many pages or even a volume to record in words. Almost anything concerning an area may be shown on a map—the form, the size, the location, direction, topography, transportation, vegetation, industries, etc. This "shorthand record" is like a foreign language. Children cannot be faced with a conventional map and be expected to read it without any prior preparation. We would not expect a child who had never been taught to read to be able to open an adult book and read it, not even if it were a simplified version. Yet, with maps, we do this continually. At the fourth grade level, many social studies textbooks include maps which assume a skill with a "language" that may never have been taught.

Furthermore, we do not wish children to study maps merely to understand them. We have children study maps in order to understand relations about the earth and its inhabitants. A map symbol does not stand for a word. A child does not understand a map symbol when he has learned to name it. Should we be content when a child calls a wiggly line a river and a dot a city? This kind of learning breeds many common misconceptions, such as:

Belief that a plain is flat as a floor.
Confusion of *mouth* and *source* of rivers.
Ignorance of *upstream* and *downstream* direction of rivers.
Incomplete concept of climate, thinking it is synonymous with temperature alone or thinking it can be adequately described as "good" or "bad."
Confusion of *north* with *up*, *south* with *down*.
Thinking that it never rains in a desert.
Thinking that farther and farther south (all the way to the South Pole) the climate is warmer and warmer.[1]

It becomes quite obvious that only when a map symbol calls forth a mental image in the mind of the child, can he use the map "shorthand" with any significant meaning. Just as a trained musician can look at a score and hear the music, so a person skilled in the use of maps can look at one and bring forth imagery of the landscape—the hills and rivers, arid and growing regions, fields of wheat. He can feel the heat and the cold, the dryness and the dampness. Furthermore, the cultural symbols: highways, railroads, cities, etc., tell him something of what the people have done with their land and their climate. What then are some of the skills our pupils need if maps are to be a useful tool to learning?

Five Basic Map Skills

Research in the literature offers us many lists of map skills. I have settled on the following five skills as the ones most necessary for our pupils if we are to have the kind of literate citizenry our times demand. First, we must be concerned with location, including orientation and direction. The second basic map skill is a knowledge of symbols, both physical and cultural. The third requisite is some understanding of scale. Fourth, pupils need to develop an awareness of relative location. Fifth, the globe should be recognized as a model of the earth. We begin to provide experiences for teaching each of these skills in their simplest form from first grade on. As the children mature and enrich their background, we can extend our expectations.

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[1] Isabelle K. Hart, *The Teaching of Geography*, The Thirty-Second Yearbook of the National Society for the Study of Education, Bloomington, Illinois, 1933, Chapter XXIX, Part II, "A Classification of Common Errors in Geography Made by Teachers and Pupils," pp. 478-483.

Experiences Necessary to Develop The Skills

Location. We want children to become increasingly oriented in space. We can encourage them to orient themselves in relation to familiar landmarks: "near the park," "beyond the store," "by the river."

Very early we want to encourage the use of *up* as meaning away from the center of the earth; *down,* as meaning toward the center of the earth. We throw a ball up into the air; a kite flies up; an airplane flies up. A teeter-totter goes up and down; we climb up the stairs and slide down the slide. We go up a hill and down a hill. We can look up at the mountain peak. We dig a hole down into the earth. We can look down at a river in the bottom of a canyon. If we have children associate up and down properly right from the start, we may avoid the confusion of misusing up for north and down for south when we discuss cardinal directions. Perhaps, if we establish the correct meaning of up and down early enough, children will not have difficulty picturing a river flowing north.

In order to build some understanding of North, South, East, and West in reference to maps, children should experience these directions first in relation to the earth. By planning a series of outdoor lessons, we can call children's attention to the different position in which we see the sun at different times of day. Ask the children such questions as:

Where is the sun early in the morning?
Where is the sun at noon?
Where is it late in the afternoon?

By the end of first grade they should be able to understand:

The sun is low in the eastern sky in the early morning.
The sun is high in the southern sky at noon.
The sun is low in the western sky in the late afternoon.

We should encourage children to use cardinal directions in their speech.

We also want children to understand that shadows help them know cardinal directions; and we take them outdoors to see their noon shadows. Once they have established their noon shadows as falling toward the north, we begin to study the directions of shadows during the day. If your room has a window facing south, place an eighteen-inch-square board on the window sill. Drive a nail on the south side of the board. Allow the nail to stick up several inches and mark the shadows each hour. If no window faces south, a post can be erected in the school yard and the position of the shadow recorded from hour to hour. Encourage the children to check the direction of their shadows in the morning, at noon, and at recess. Have them check the shadows thrown by posts, trees, buildings, etc. With distributed practice throughout the primary grades, children will learn to determine approximate direction from studying sun position and shadows.

Thus, as we use cardinal directions in speech and begin to note them on our maps, the terms North, South, East, and West will have some meaning.

It is wise to hang North, South, East, and West labels on the walls of the classroom. In the primary grades, all maps should be kept in a horizontal position, either on the floor or on a table top to help pupils relate cardinal directions on maps to directions on the earth's surface. All maps should be labelled with cardinal directions. The North arrow should also be introduced. It might be wise to use both the four direction labels *and* the North arrow until the concept of the North arrow is mastered. In-between directions can be used in speech as the children become able to grasp them.

On the globe, we are concerned with establishing north as toward the North Pole, south as toward the South Pole. Then we introduce the Equator as an east-west line lying halfway between the poles and also establish north and south in relation to the equator. On a map,

children can use streets and roads as a grid for determining direction. "The house is north of Third Street." "The school is east of Maple Avenue.

Symbols. In teaching symbols we are most anxious that a child not be confronted with a symbol on a map for which he has no mental image. There is a certain progression in teaching of map symbols that is in keeping with good learning theories. We move from the known, the concrete, the near at hand to the unknown, the abstract, the far away. In the use of maps this means we start with the observable environment. Take the children on a trip around several blocks near the school, to a park, or some other place of interest. We assume that what you choose to map will be related to the social studies curriculum. Have the children observe the landscape with the intention of reproducing it on a map. This means that they must orient themselves and observe carefully the relationships of the features they will wish to reproduce. When they return to the classroom, the children, with the help of the teacher, will then reproduce the landscape on a floor map, or table model, roughly laying out streets, streams, etc. in proper orientation. Toys, blocks, and other props can be used as symbols and placed in correct relation to each other and to the base map. This three-dimensional reproduction of the observed landscape is the first step in mapping. The second step would be to reproduce on paper what they have seen in order to produce a more permanent record. When they decide on the pictorial symbol they will use to represent the school, a house or other building, a street or railroad, they can then plan a legend so others will also understand the symbols they have used. Making of maps *following* observation of the landscape is the one way of insuring that the feature symbolized has a true image behind it. Eventually, under the teacher's guidance, the pupils can replace their pictorial symbols with more conventional symbols. This would be step three. However, the child has arrived at the abstract symbol through his own experience. Now, if he should see a map made by others using the same abstract symbol, he is prepared to invest that symbol with a correct image. The maps thus developed by children can be reproduced in smaller scale and mimeographed by the teacher. Perhaps another trip can be taken using their map to plot the trip.

It is not always possible to take a trip. The same three steps in mapping can also be done starting with a picture. It is best to choose a picture that was taken looking down at the features of the landscape. Many pictures in the new social studies books lend themselves to such mapping. If we encourage the children to lay out their map by plotting in the streets and roads, rivers and lakes first to form their base map, the other symbols can then be added in their proper relationship: first with three-dimensional objects, then with pictorial symbols, later with abstract symbols. It is best not to skip steps until the children have had several experiences and can easily bridge the gap because they are repeating symbols previously developed. A legend should be placed in the lower left-hand corner of the map, which is its proper position. Cardinal directions should be labelled.

The particular symbols pupils learn will depend upon the landscape they are exploring in their home, school, neighborhood or local community. It will also depend on the content area of the social studies. An attempt should be made to observe land and water bodies and their relations to other physical features which are available in the immediate environment as a basis for comparison with areas they cannot see. Roads, railroads, bridges, buildings, farms, cities, towns, and other cultural features should be

called to children's attention for mapping purposes. Where any of the common features are not available close at hand, pictures should be used to extend pupils' knowledge. Children who live on farms should see pictures of cities; city children should see pictures of rural environments; children of the plains should be introduced to pictures of mountainous areas; other children need to see pictures of desert areas, etc.

As children study their environment and draw their maps, they should be helped to see the relationship between the cultural feature and its physical base. Children should study effects before causes. They should study human activity before physical conditions. For example, children might be taken to see a dam and the lake formed by it which is now used for irrigation. They should then have their attention called to the physical environment that helped bring it into being. In this way, children will be able more accurately to understand cultural-physical relationships, which is one of our major purposes in map study. If we ask children to project possible land uses from a study of the physical features first, we are demanding a background in history, cultural traditions, mineral resources and state of technology that are much beyond the experience of young children.

When children have had ample opportunities to observe their environment and study well-selected pictures, when they have had adequate experiences with three-dimensional, pictorial, and abstract mapping, they are ready to begin the study of maps made by others. The maps they study should follow a similar sequence. The first maps children see should be large-scale base maps made by the teacher showing areas which they have observed first-hand or in familiar pictures. To these base maps, children add their three-dimensional symbols, pictorial symbols, and then abstract symbols. The children are now ready for very simple teacher-made or textbook maps on which these familiar symbols appear. They should have many experiences with pictorial and semi-pictorial maps which are kept simple and uncluttered. The number of symbols appearing on any one map should be limited and serve a specific purpose: the setting of the school in its immediate neighborhood; the layout of a shipping area; the ground plan of a nearby farm; the route taken on a short trip. Only the major physical and cultural features need be included.

The legend, of course, clarifies the symbols. It is best to use the same symbols consistently. However, slight variations from map to map should not be too difficult if pupils have developed the mental images for the symbols. It is wise to make a large chart of familiar map symbols, coupling a picture and the abstract symbol for it. Symbols charts are also available commercially. Care must be taken, however, to make sure that the mental images are adequately developed. Enlarging such commercial materials with an opaque projector helps. However, land and water relations are very difficult for children to visualize even when they observe them in their own environment. How can children understand that an island is the top of an almost submerged piece of land? How can children understand the direction of flow of a river? The only way I know of adequately clarifying such relations is with a three-dimensional model which can be flooded and drained.

Scale. When a person wishes to study a map, there are three things he must establish immediately: cardinal directions related to this area on the map, the symbols used as depicted in the legend, and the scale of the map. If some sort of scale is not established, there is no way of knowing how large the area is nor the distances between features.

Scale becomes important very early.

When children lay out a floor map of an area, a very rough idea of scale is involved since the floor scheme is smaller than the original landscape. Relative distance must be considered as each object is placed to represent the actual feature seen. Children compare distances between places on the same map: "The store is nearer to home than to school." "The park is half-way between school and the highway." "The barn is half-way to the river."

Children can learn to measure distance by use of a scale chosen in relation to the landscape or area they wish to represent. For example, a given-sized wooden block can stand for a city block or an acre or a square mile out in the country. As they represent the same area on different-sized sheets of paper, the concept of scale is being developed. Even on their pictorial maps, children can be helped to think in terms of scale: so many blocks to the store, so many feet, yards, or miles to the river. Finally, children may be able to recognize the scale of a map not of their own making, and use that scale to compute distances. The type of scale used in the early grades should be a very simple graphic one: an inch to a foot; an inch to a yard; an inch to a mile. Large maps of small areas should be studied first and then placed in the context of a map of a larger area which includes the smaller area.

Children can be helped to understand the principle of scale by looking down at a landscape from a height and taking careful note what happens to size as they get higher and higher above it. They may make estimates of the size of a given feature as seen from a height and then measure it as they come closer. This might help them see why features get smaller as more and more area is covered on a map.

In working with globes, children can learn that different-sized globes represent the same earth. The poles can be located; the equator can be described as being half-way between the poles. The idea of latitude may be introduced, but only as distance north or south from the equator toward the poles.

Relative location. The location of any place on a map is only the beginning. What counts is the comprehension of the functional significance of that location. Meyer[2] asks six questions concerning relative location which may serve as an excellent guide:

> Where is the place in terms of latitude, coastline, and type of climate?
> Where is it in terms of elevation, relief, landform, water bodies?
> Where is it in terms of neighboring peoples, cities, and countries?
> Where is it in terms of dominant types of agriculture, of manufacture, or other land-use forms?
> Where is it in terms of types of soil, vegetation, mineral resources?
> Where is it in terms of transportation and commerce?

It is obvious that the questions as stated are not directly applicable to pupils in the early grades, but these questions are easily translated to the area of their concern: Where is our community located? In the mountains? On a river? Is it hot or cold? Is there much rainfall? When do things grow? Is it in a desert or near a mine? Are we near corn or cattle country? Are we a manufacturing community?

It is obvious that children living in a cotton-growing area will find different content as they investigate their local community, than will children living in a large trading center or in an isolated mountain community. However, the *influence* of "relative location" would be equally significant in investigating any area.

Even within the community, impor-

[2] Alfred H. Meyer, *Geographic Approaches to Social Education*, Nineteenth Yearbook of the National Council for Social Studies, Washington, D.C., 1948, Chapter XXV, "Geography in the Teacher Education Program," p. 284.

portant differences arise due to relative location. In a large city, for example, it will make a difference whether children live in a congested apartment area or in the suburbs. There will be important variations in fire and police protection, work of parents, kinds of transportation and communication used, opportunities for aesthetic and religious expression, number of parks and libraries, kinds and amount of recreation available, number and crowding of schools, etc. In an agricultural community, it will matter greatly whether soil is fertile, when the rains come, what the major product is, how many or few roads there are, how far apart people live, what means are available for aesthetic, religious, recreational and educational functions.

In making their maps, children will discover where certain features are located and how these relate to railroads, waterways, physical features and land-use. At a very elementary level, children may be checking to discover where fire hydrants occur or how far it is to the nearest park for children located in different neighborhoods. They may discover that this was a good year for one crop and a difficult year for another crop. A river may flood, and they may discover that the slope of the land makes a big difference; perhaps their best friend's home was inundated while their own remained untouched because the ground level was higher. If children are led to analyze the relative location of every place being studied, they will build a background for understanding events in our world today.

The globe as a model of the earth. What learning can children be expected to gain from globes? Globes should be available informally for children to handle even in first grade. The pupils can be told that the globe shows the shape of the earth; that we live on the earth; and that the position of our own home can be found on the globe. The globe is useful if only to demonstrate that there are other places with other people and that this is their earth, too.

Children become interested in the size and shape of land and water bodies. As children ask about places, they become accustomed to strange-sounding names and do not think of them as "funny"; soon these places sound as right as our own familiar ones. This is important because so often "strange" is taken to mean "wrong."

Technically, the globe lends itself to developing the concept of up and down. Also, children can be helped to see that north is toward the North Pole, south is toward the South Pole. Children can locate the equator and see its relationship to the poles. To the extent that their interests are aroused, they may learn the names of our own continent and adjacent oceans, then the names and shapes of other continents and oceans. With a slated globe that shows only land and water bodies, children can write the names of land and water bodies as they become acquainted with them. They may name and locate important places that arise within their social studies or other context. Names and places should have some relevance to the pupils on-going concerns. In the early grades, it is probably best to have only continent and ocean names remain on the globe, so as not to confuse smaller land subdivisions with continent names.

Where globes have been made available to children in the primary grades, the children have often become fascinated with them, spending much of their free time thoughtfully gazing at them, rotating them, and often asking very good questions. Barton[3] describes an experiment with globes in a second grade class-

[3] Thomas Frank Barton, *Geographic Approaches to Social Education*, Nineteenth Yearbook of the National Council for Social Studies, Washington, D.C., 1948, Chapter XVIII, "Geographic Instruction in the Primary Grades," pp. 214-225.

room. Most of the pupils' questions were political-locational in nature: "My uncle is in Texas. Where is Texas?" "Is this Illinois?" "Where is England?" "What does the blue show?" One boy, after four days of seemingly aimless examination, generalized: "The water never ends." Perhaps this is a good way to begin one's geographic education for better world understanding.

NATIONAL COUNCIL AT WORK

NCGE Announces Awards to Outstanding Seniors

The National Council for Geographic Education announces annual awards to outstanding senior geography majors.

The purpose of these awards is to recognize excellence of scholarship and to help geographers, early in their careers, to become identified with the work of the National Council.

The first awards will be for the academic year, 1960-1961. Certificates will be presented to winners at the annual NCGE meeting in Philadelphia, November 24-25, 1961. Students who are unable to attend the meeting will receive their certificates by mail.

Each department offering a geography major is invited to designate its most outstanding senior major for the current year. Criteria for selecting the award winner are to be decided upon by each department. Awards should be made, however, only to students exhibiting excellence of scholarship.

The name of each award winner should be sent in no later than June 15, 1961, to Dr. Lorrin G. Kennamer, Jr., Secretary, National Council for Geographic Ed., Department of Geography, University of Texas, Austin, Texas.

A Student Section of the National Council for Geographic Education

The second meeting of geography students took place on November 25, 1960 at the annual meeting of the National Council for Geographic Education in Cincinnati, Ohio.

Planning for a geography students' section was begun at the Detroit meeting in 1959. At that time there were present representatives from the following educational institutions: Trenton State College, Carroll College, University of Wisconsin, Michigan State University, Eastern Michigan University, Indiana (Pennsylvania) State College, and Kutztown State College. Suggestions for organizing a students' section were made at this time by the students, as well as by Dr. Nora Zinc, Indiana State College.

At the Cincinnati meeting there were again several educational institutions represented. Dr. Benjamin F. Richason, Professor of Geography at Carroll College, Wisconsin, agreed to act as sponsor of the group. The officers elected for the following year were: Miss Wilma Jane Luchsinger, Indiana State College, chairman; Miss Nancy Brownhill, Indiana State College, vice-chairman; and Mr. Charles Calkins, Carroll College, secretary.

The Student Division, which is the first division of the National Council for Geographic Education, has been organized in the belief that it can offer something of value to the geography students of the nation. It is hoped that through this group, the students will find it possible to hear outstanding geographers speak, learn more about positions which are available in the field of geography, learn what other students are doing in the field of geography, and to meet and talk with noted geographers and students from other areas of the country.

With these aims in mind, it is hoped that many geography students will find it possible to attend the next meeting of the Student Division which will be held during the National Council for Geographic Education meeting in 1961 at Philadelphia, Pennsylvania. An outstanding program is being planned for this meeting which will parallel that of the N.C.G.E. Those who would be interested in participating in this meeting, or who would like additional information concerning the Student Division, are instructed to write to either Miss Wilma Jane Luchsinger, Indiana State College, Indiana, Pennsylvania, or Dr. Benjamin F. Richason, Carroll College, Waukesha, Wisconsin.

GEOGRAPHIC MATERIALS RECEIVED

T. H. Elkins. **Germany.** Christophers 40-42 William IV Street, London, W.C. 2, England, 1960. 272 pages including table of contents, lists of maps, diagrams, tables and index. Approximately 15 s.

D. S. Walker. **The Mediterranean Lands.** John Wiley & Sons Inc., 440 Fourth Street, New York 16, New York, 1960. 524 pages including table of contents, plates, maps, diagrams and index.

May Edel. **The Story of People.** Little, Brown and Company, Beacon Street 34, Boston 6, Mass., 1953. 197 pages including table of contents and index. $3.00.

H. Percy Wilkins. **Clouds, Rings and Crocodiles.** Little, Brown and Company, Beacon Street 34, Boston 6, Mass., 1955. 148 pages including table of contents. $3.00.

Thomas Frank Barton. **Patrick Henry: Boy Spokesman.** Bobbs-Merrill Company, Inc., 1720 38th Street, Indianapolis, Ind., 1960. 192 pages with table of contents. $1.95.

Francis Mazier. **Teiva, Boy of Tahiti.** Follett Publishing Company, 1010 West Washington Boulevard, Chicago 7, Illinois, 1960. 47 pages. Ages 8-10. $2.00.

Heinrich Leinhard. **From St. Louis to Sutter's Fort, 1846.** (Translated and edited by Erwin G. and Elizabeth K. Gudde). University of Oklahoma Press, Norman, Oklahoma, 1961. 204 pages including table of contents, a map, list of illustrations and index. $3.95.

Calvin J. Heusser. **Late-Pleistocene Environments of North Pacific North America.** American Geographical Society, Broadway at 156th Street, New York 32, N.Y., 1960. 308 pages including table of contents, glossary, literature cited, plates and index. $6.00.

Wilbert E. Moore and Arnold S. Feldman, editors. **Labor Commitment and Social Change in Developing Areas.** Social Science Research Council, 230 Park Avenue, New York 17, N.Y., 1960. 378 pages including table of contents and indexes. $3.75.

Benjamin Appel. **The Illustrated Book About South America including Mexico and Central America.** Grosset and Dunlap, 1107 Broadway, New York 10, N.Y. 1961. 101 pages including table of contents and index. $3.95.

Frank Debenham. **Antarctica.** The Macmillan Company, 60 Fifth Avenue, New York 11, N.Y., 1959. 264 pages including table of contents, list of illustrations and index. $5.50.

Martha Ferguson McKeown. **Mountains Ahead.** G. P. Putnam's Sons, 200 Madison Avenue, New York 16, N.Y. 1961., 448 pages. $4.95.

George Gerster. **Sahara, Desert of Destiny.** (Translated by Stewart Thomson.) Coward-McCann, Inc., 200 Madison Avenue, New York 16, N.Y., 1961. 302 pages including table of contents, glossary, bibliography and index. $5.00.

BOOK REVIEWS

Nicholas Polunin. **Introduction to Plant Geography.** McGraw-Hill Book Company, 330 West 42nd Street, New York 36, New York, 1960. 636 pages with index, table of contents, maps, illustrations. $10.00.

The term plant geography suggests a branch of geography comparable to such categories as urban geography or political geography. To the geographer more familiar with the term, however, it means a branch of botany generally using geographic techniques to confront essentially botanical problems. In spite of an impressive introduction, Nicholas Polunin's book follows in the same vein as earlier books with "plant geography" in the title. The author is a botanist and the point of view throughout is botanical.

Introduction to Plant Geography is a comprehensive book. The first half is concerned with individual plants, including economic plants. Of little interest to the geographer are descriptions of various plant groups (phyla, classes, and orders) and their evolutionary development. More useful are the expositions on adaptation, form, dispersal, and migration. Geography as such appears in the discussion of kinds of distribution of species and the patterns of important crop plants.

The second half of the book is concerned with vegetation, introduced by discussions of environmental factors, habitats, successions, and climaxes. Recent useful concepts, such as evapotranspiration, are not mentioned. The author then plunges directly into a careful description of various specific vegetation types, with major examples. The types are grouped roughly in terms of latitude (temperate, polar, tropical) and then aquatic types (fresh water and seas). The only map on vegetation is a fold-out at the front of the book bearing a note that the designations thereon do not necessarily correspond to the text.

DAVID J. DE LAUBENFELS
Syracuse University

Marie Halun Bloch. **Mountains on the Move.** Coward-McCann, Inc., New York, 1960. 96 pages with maps, diagrams, pictures, and table of contents. Juvenile ages ten and up. $3.00.

Geographers should be pleased to find a book

about the evolution of landforms that is written on a level suitable for children. Marie Halun Bloch had a good idea in writing such a book. Her primary aim is to show children that the landforms we see today are not the landforms that would have been seen had one been here eighty or ninety million years ago.

The first chapter takes the reader on a journey across the United States with the forty-niners, and describes briefly the main physiographic regions that the forty-niners crossed. Later chapters explain how rock is broken into boulders, gravel, sand, and silt; how soil is formed; how landforms result from the work of rivers and glaciers and from the forces of diastrophism and vulcanism; and how sedimentary rock layers are formed on the bottoms of seas. For the most part, the treatment is in terminolgy that children can understand.

The selection of pictures is especially good to illustrate points made in the book. One big map, however, is in such error as to give serious misconceptions to children. Specifically, the map represents the mountains of the United States as a continuous festoon without break from Labrador to Mississippi, northwestward into Arkansas, southwestward into southern Texas, westward and then northward to the Canadian Rockies.

The writing is aimed at the child's level of comprehension. The reviewer is disappointed, however, to find too much simplification in some places, misstatement of fact in other places, and serious errors in grammar and composition throughout. If these elements of the writing had been avoided, the objectives of the book would have been served much better than they have been.

MARJORIE SMITH GOODMAN
University of Detroit

O. G. Sutton. **Understanding Weather.** Penguin Books, Inc., 3300 Clipper Mill Road, Baltimore 11, Maryland, 1960. 215 pages, including tables of contents, index, and 38 illustrations. Paper back $.95.

This is a collection of essays on recent developments in the science of meteorology rather than a systematic treatment of the subject. The author is Sir Graham Sutton, Director General of the British Meteorological Office. Sir Graham stresses new developments in atmospheric research brought about by the use of high-altitude soundings with balloons and rockets, new ideas concerning the general circulation of the atmosphere, the new field of cloud seeding and artificial nucleation, new methods of forecasting by numerical analysis, and micrometeorology. Included as an appendix is a summary of the instruments and methods employed in meteorological observations, and a brief summary of the organization of weather observation in the United Kingdom.

This book is written essentially for the educated reader outside the field of meteorology, but it is more than a popularization. It should be particularly interesting to geographers who wish to bring themselves up to date on many of the recent developments in the study of weather. Especially valuable to teachers of physical geography will be the chapter on the "Atmospheric Engine" in which the author presents recent concepts of the general circulation, the section on winds, clouds, and rain and "rainmaking," and the chapter on micrometeorology.

This book has much to recommend it to geographers regardless of their specific interests. As the author says, meteorology "is the most fascinating and exasperating of all the earth sciences," a contention that is well born out by this fascinating little book.

WALLACE E. AKIN
Drake University
Des Moines, Iowa

Robert Steelman. **Call of the Arctic.** Coward-McCann, Inc., 200 Madison Avenue, New York 16, N.Y., 1960. 316 pages. $5.00.

This interesting biography of Charles Francis Hall describing his indomitable will to explore the American Arctic and his hopes to ascend to a kind of pinnacle of fame if perchance he might achieve the North Pole, is for the most part in the nature of a well told historical novel. The vehicle of medium for achieving the personal touch is to create a certain Adam Burritt who serves as a friend and as the interpreter of Hall's actions. This gives a very personal and friendly touch to the story and almost immediately wins sympathy for Hall and his cause.

Charles Francis Hall made three trips into the Arctic, the first two (1860-62 and 1864-69) motivated mainly by his sincere and burning desire to find traces of the Sir Martin Frobisher and the Sir John Franklin expeditions lost in the Canadian Arctic, and the third in 1870-73 as director of a United States Government expedition in search of a way to and the achievement of the North Pole. The first two were somewhat successful, the last, interestingly, reached 82° 11′ —the farthest north point to date, but it ended disastrously.

This reviewer is surprised to see no introduction or preface with, or elsewhere a comment on sources used. There are no footnotes or any form of documentation to lend authority to the wealth of fascinating background and personal descriptions. This reviewer can hardly agree with the statement on the fly-leaf that this book is "Authentic in all its details . . ." and that it ". . . also catches perfectly the excitement of the far North." It seems hardly to match up to that in view of the lack of sources and the highly imaginative creation. The end papers are a reproduction of a map of Arctic America; but the complete legend showing Hall's routes in color on the printed map is not reproduced. This book is very entertaining and interesting but not as an historical record.

HERMAN R. FRIIS
The National Archives

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BOOK REVIEWS

Calvin I. Kephart, editor. **Races of Mankind: Their Origin and Migration.** Philosophical Library, Inc., 15 East Fortieth St., New York, 1960. 566 pages. $6.00.

This is an ambitious book. On its title page it carries the extraordinary claim that in it are "all recognized ancient tribes and nations identified and their migrations traced." It is difficult for the reader to discover the source of this amazing knowledge; there is no bibliography, and footnotes are to sources of very doubtful validity. Nevertheless, the author dispels our doubts. Man originated in Java. From here the human race migrated slowly through Mayala to India, stopping at intervals to spawn a race or two. The yellow race "evolved in and east of Burma," the black "in the Ganges River valley," and the Aryan "on the central plateau of the Dekkan (*sic.*)." This is new; the reviewer had supposed that they originated when Shem, Ham and Japhet stepped out of the Ark on Mount Ararat. The Slav sub-race derives from the Pamirs. And so this tissue of absurdities continues. Among the multitude of mistakes, there are two errors of omission which invalidates the whole. The author traces the movement of "races" without reference to anthropological evidence, and on almost every page there is a confusion between racial groups and language or cultural groups. The author is a racist asserting in his preface the purity and superiority of certain races. This reviewer found no footnote reference to Alfred Rosenberg, a serious omission because the debt would appear to be great. The author claims that his conclusions are new and little known. No one can doubt the former; let us hope that they remain little known.

NORMAN J. G. POUNDS

Indiana University

Barnett D. Laschever. **Getting to Know India.** Coward-McCann, Inc., 210 Madison Ave., New York 16, New York, 1960. 64 pages with illustrations. $2.50. Ages 8-12.

This is a most charming book with beautiful illustrations. In a very digestible way, it gives a great deal of information about India. Moreover, that information is correct (as one of my Indian students testified). The book should be excellent reading for geography classes discussing India. Miss Elgin is a talented artist and some of her drawings are real masterpieces.

The only criticism I have—and it is an important one, is the map. Kashmir in its entirety is indicated as part of India; the Jumna River is incorrectly located, and the town of Jaipur as shown on the map is not the one mentioned in the book. Probably Mr. Laschever did not see the map; authors cannot be too careful.

SAMUEL VAN VALKENBURG

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BOOK REVIEWS

Patricia H. Suttler, Editor. **Elementary Teachers Guide to Free Curriculum Materials.** Seventeenth Annual Edition, Education Progress Service, Randolph, Wisconsin, 1960. 323 pages. $7.50.

The 1960 edition of *Elementary Teachers Guide to Free Curriculum Materials*, seventeenth in a series of annual volumes, has been completely revised for use during the 1960-1961 school year. It comprises 1,298 items, 547 of which were not listed in the previous edition. It consists of a complete, up-to-date, and conveniently annotated schedule of free learning aids, such as maps, charts, bulletins, pamphlets, exhibits and books. This guide is designed particularly to provide busy elementary and junior high teachers, supervisors, and administrators, with a comprehensive list of current, free curriculum materials.

The guide is organized by titles, subject areas, and sources. Other significant features are the Indexes in color for speedy reference, the sample Units using free materials, and the timely, stimulating articles by eminent educators.

In the judgment of the reviewer, this guide to free materials is an indispensable aid to teachers and should be in every school library.

MARY VIOLA PHILLIPS
University of Pittsburgh

Manorama R. Modak. **The Land and the People of India.** J. B. Lippincott Co., East Washington Square, Philadelphia 5, Pa., 2nd ed., 1960. 127 pages with one cartogram, 41 photographs and an index. $2.95. (Portraits of the Nations Series)

The author states, "This small book attempts only to set forth briefly and in outline the picture which the Indian people have of their country and of themselves." In making this attempt she gives much information of the area.

"Chapter I, The Land of India," gives a quick reconnaissance geography of the country. The next seven chapters deal with history, starting with "The People of India—Before 800 B.C." and ending with "Bharat: The Republic of India—From 1947—." Two concluding chapters discuss "Heroes of Yesterday and Today" and "Neighborhood and Family." Well selected photographs add detail to the study of the landscape and history of India.

As the statement of purpose indicates, Mrs. Modak presents the Indian point of view, naturally a bit anti-British. Her approach is that of an educated person who knows the area; but space limitations and patriotism lead to broad generalizations, some of which may be questioned. She speaks of early Indian civilization (p. 20) saying, ". . . this civilization was the mother of all Western cultures, . . ." The same page contains, "Her wealth—second greatest in the world—lies in her mountains and deserts and in her level fields."

The statement, "Oil has now been found in many areas of Bharat, . . ." (p. 97), may cause the untrained reader to consider India an important oil producer. It was a surprise to see India erroneously placed as the world's greatest tobacco producer, above both the United States and China, and even more surprising to see, "She possesses . . . 49 per cent of the world's bauxite." (p. 96).

In spite of broad generalizations, the author achieves her purpose remarkably well. As one finishes reading the book he can better understand the Indian's pride in his country, Bharat, and in its culture, religions, heroes, political organization, plans for economic development, and its place in today's world.

JAMES WOODALL TAYLOR
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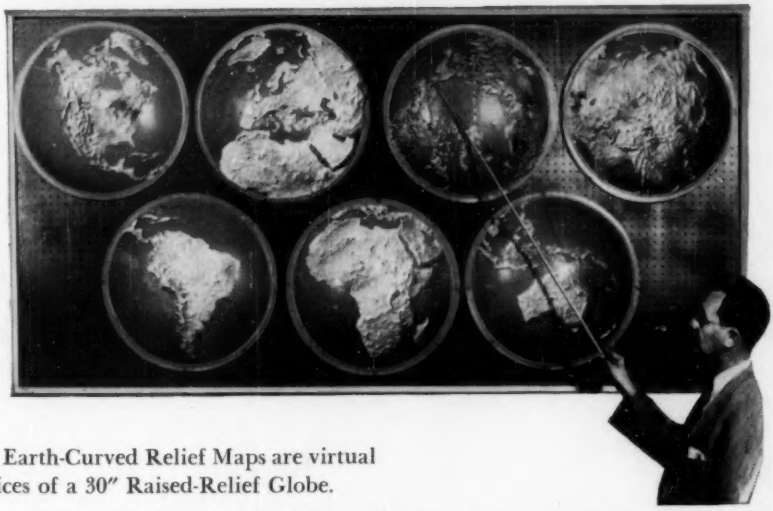

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